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New Series, Vol. VI. No. 6.

JUNE 1911.

EDINBURGH^h MEDICAL JOURNAL

WITH WHICH IS INCORPORATED

The Scottish Medical and Surgical Journal

EDITED

BY

NORMAN WALKER & ALEXANDER MILES



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NEW SERIES

VOL. VI



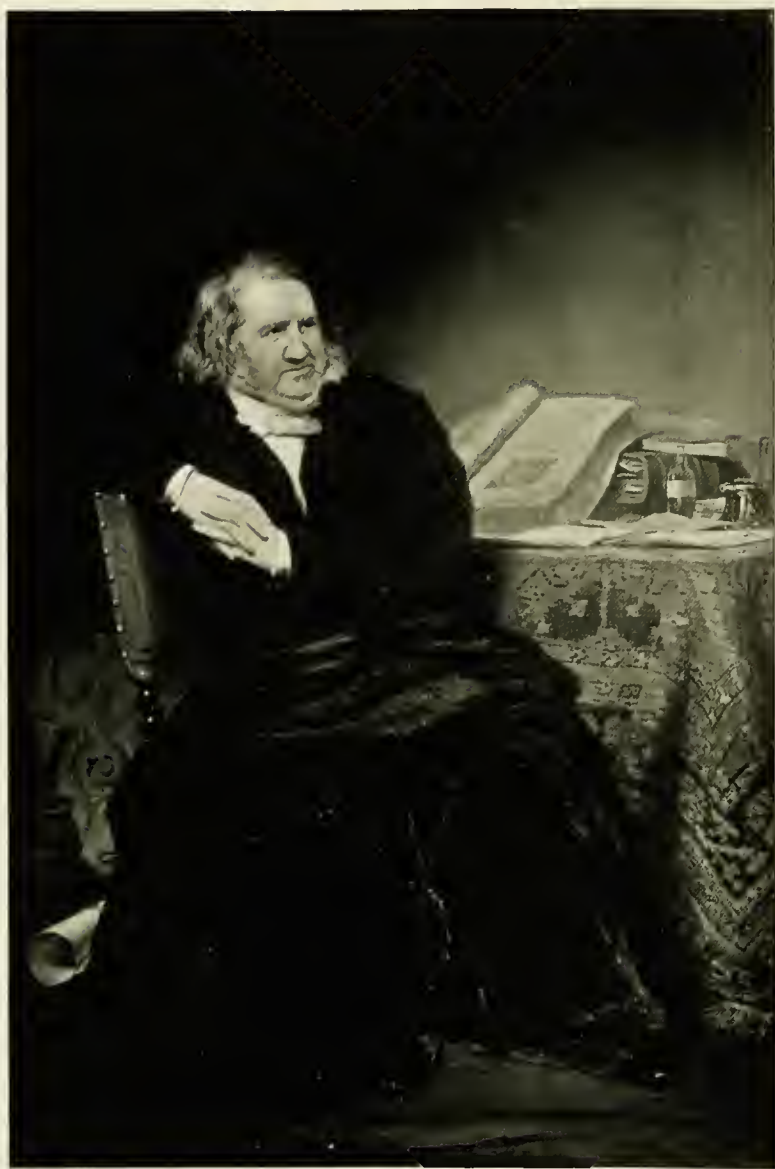
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1911

PLATE I.



SIR JAMES Y. SIMPSON.

(From a portrait by Norman Macbeth, R.S.A., in the possession of Sir Alexander Simpson.)

THIS NUMBER OF THE
EDINBURGH
MEDICAL JOURNAL

IS DEDICATED TO THE MEMORY OF

James Young Simpson

Born at Bathgate, Linlithgowshire, 7th June 1811

Died at Edinburgh, 6th May 1870

" "TO WHOSE GENIUS AND BENEVOLENCE THE WORLD OWES THE BLESSINGS DERIVED
FROM THE USE OF CHLOROFORM FOR THE RELIEF OF SUFFERING." *

The Editors desire to acknowledge their indebtedness to Miss EVE BLANTYRE SIMPSON, to Dr. JOSEPH ANDERSON, of the Society of Antiquaries of Scotland, and to the various Medical Contributors who have aided them in the preparation of this tribute to the memory of Sir JAMES Y. SIMPSON.

They have also to thank Miss SIMPSON for the use of a series of photographs by J. D. EDWARDS, Edinburgh; Dr. A. H. FREELAND BARBOUR for the frontispiece portrait; and the Royal College of Physicians, Edinburgh, for permission to reproduce the autograph letter from their collection.

* On his bust at Westminster.

SIR JAMES Y. SIMPSON.

By EVE BLANTYRE SIMPSON.

HAVING been asked on the centenary of his birth to contribute recollections of my father, as I said in the preface of a biography I wrote of him in the Famous Scots Series, my chief difficulty is to give in the space allowed an adequate sketch of a truly great man, and also to avoid the unconscious hero-worship of filial affection for one who was not only the best of fathers but the best and most lovable of men. The latter statement has corroboration in a pamphlet of Dr. George Balfour's on my father, written in 1870—"If no physician was ever more widely known it is still more true that no man, since the world was, was ever more greatly loved, and we do not exaggerate when we say we never knew a more lovable man." It is forty-one years this May since he passed away to what he longed for during forty-four of the fifty-eight years of his pilgrimage here, and what in some verses he wrote he called "a rest that knows no ending." He who gave sleep to the pain-stricken, who made the lancet doubly useful by plunging patients into a little death in life so that the artist hand of the surgeon could carve as it listed, craved often for *time* to sleep. He had the gift of it, could go into the "land of Nod," he said, in a rattling carriage, or snatch forty winks at will, but so incessantly did he work, night as well as day, he was deprived of the ordinary hours of slumber.

Pictures of him are vividly engraven on the tablets of memory, but they are difficult to reproduce. He was made in a unique mould, both in body and mind. Along with his great brain, his attractive personality, was his heart-whole eagerness for human advancement, his genuine humble-mindedness, which went far to make him a power for good in this world; to keep him what Burns avers a king, despite showering titles, cannot make—an honest man. There is no doubt my father was undoubtedly that *rara avis*, a genius. "I do not know," says the Duke of Argyll of Sir James, "that I ever met any man in whom genius was written more in face and voice and manner:" and Dr. Morell Mackenzie, lecturing in Edinburgh on culture, spoke of distinguished Scots past and present, but he said: "He omitted to mention the name of Simpson because he placed him far above cultured men. *He was a genius*, and though they might all have

some culture they could not all be geniuses." A genius at home is too often noted as being "gie ill to live with," but my father was an exception to this rule, with his frugally simple tastes and even temper. One failing he had, he was hospitable with an almost childish simplicity. A ball was to be given for his eldest son's home-coming as his assistant. The professor was chid for asking everyone he met. A discussion arose at dinner as to whether there were sufficient men. On the day of the ball he hurried in beaming from his lecture. "I asked all my class to come to-night. They seemed so pleased. There will be partners enough now."

From his children's point of view the trouble of having a genius for a father, and one with such a magnetic nature as his, was that we had him very seldom to ourselves. His doors veritably stood open, his board was always spread. Red-letter days, alack! too few in his calendar for himself as well as for us, were those in which we were suddenly bidden to come on what he called a "scamper" with him, *i.e.* a hastily arranged, hastily taken excursion, likely a patient at the end of it, with maybe some hoary circle or cup-marked stones to be seen on the way. Sundays we saw more of him. The meals at 52 Queen Street on that day were taken usually with only the residents of the house, no lunch at which any amount invited or uninvited might appear. He always had four o'clock tea long before it was the custom, and we used to see him then for a few minutes; on Sundays he had tea-dinner at six, a meal which, unmanlike, he dearly loved. When opportunity offered he took a keen interest in all that we were concerned in, encouraging us in initial trips into the realms of fiction and poetry. Once when I was a very small child he met me on the stair, and took me in a pinafore, hatless of course, off to a house and showed me a book closely written. "Remember that is one of Scott's novels and you will soon be big enough to read it yourself," he said. It was *The Pirate*. If he saw us hesitating over a date, or a fact, or a quotation for a lesson, he would come laden with books and pour an overwhelming avalanche of them down beside us, and show various interpretations of the subject, thinking we had his unquenchable thirst for knowledge. Perhaps for a week after he might be away, or extra busy, but he would pop his head round the screen and ask if the quotation had been apt, and nod his satisfaction if it had. When we were at school he often took our dogs out on his rounds with him. He told us our favourite black-and-tan terrier, Puck, was

a capital assistant when he had children to visit. His photographs caught his outward semblance, sometimes gay, oftener thoughtful. His keen, deep-set eyes which saw so much could melt into a smile as well as the mobile lips. His countenance often was illumined by the light of which Fanny Kemble speaks—"I have seen looks that were Christ's, who has not, momentarily on mortal faces."

The house at Bathgate in which James Simpson was born on 7th June, a century ago, is now a mission hall, bought and given to his native town by a grateful patient in his memory. Main Street, where it stands (and the house opposite is the one he was brought up in, for his father, the baker's fortunes improving, they moved across the way), had in olden days been on the highway, where the coaches passed going from Glasgow to Edinburgh. Whenever my father saw a chance of a half-day free he headed for Bathgate, sometimes driving (how he would have revelled in a motor for speedy progress!), sometimes by train, and often posting over to Linlithgow to get an express home. The Bathgate of his youth was a very different place from the mining township he showed to us. It was then a countrified village, remnants of which remain in Main Street. One thoroughfare is called after a grand-uncle of his, Jervay Street. The Jervays were of Huguenot origin, and perhaps to this distant strain of French blood my father owed his readiness of thought and action, his vivacity and gladness, for he could "rainbow the tears of the world." "What," asks Lord Rosebery, speaking of the wayward but divine fire which we call genius, "what is genius? None can tell. But may it not be result in character of the conflict of violent strains of heredity which clash like flint and steel and produce the divine spark?" My father's maternal ancestors, though originally from France, for a hundred years were tenants of Balbardie Mains, and they, as well as his, Simpson forebears, had with thrifty perseverance tilled the soil in Linlithgowshire before its fields became rich and ugly in shale and oil. It is difficult to see how the "divine spark" was lit among the steady-going yeoman stock from whence he sprang. His grandfather was farrier as well as farmer, and we were shown the red-tiled byres of Slackend and a green field near, where this Alexander Simpson, unable to stay a plague among his cattle, sacrificed a cow, burying it alive to appease the spirit of murrain. My grandfather saw the earth heave after the wretched beast had been entombed. My father lent a willing ear to tales

PLATE II.



MAIN STREET, BATHGATE.

(In the house on the left Simpson was born on 7th June 1811.)

of all these old customs and superstitions. It was the irony of fate that his mother should have been a victim to a gross credulity when he, her son, did so much to relieve the sufferings of women. She had swallowed a packet of needles while dress-making. Her neighbours insisted on her gulping down a piece of raw meat to which a string was attached, and pulling it up again under the belief the needles would be found therein. My father was the proverbial lucky seventh son, but the luck lay in his father having married one who saw well to the ways of her household. Their fortunes were at a low ebb the day James was born, but mended henceforth, as my grandmother took control of affairs on her recovery, and by thrift and industry when she died at forty-nine left her family well to do. Her husband and sons promised her her heart's desire, namely, that her Jamie would have a college career. He went to Edinburgh University at fourteen, having undergone ten years' schooling. My father often said he had exceptional advantages in his youth in a happy home, humble though his surroundings were. For nine years he had the best of preceptors and teachers, a good mother, and on her death her only daughter and namesake, Mary, ably took her place, and his elder brother Sandy was his guide and counsellor, and was spared to him to the end. Cheap literature was not in vogue in his early days, but the books on the cottage shelves were read and pondered over—"More is got from one book on which the thought settles for a definite end in knowledge than from libraries skimmed over by wandering eyes. A cottage flower gives honey to the bee, a king's garden none to the butterfly."

Discussing at his luncheon table the educational value of the Bible and Shakespeare, my father candidly said: "I'd have given them both for Oliver & Boyd's *Almanac*, for I always wanted to know facts." He had learned how to search for them as a child. Bathgate was then a village of weavers, not of miners. Among them were men fond of geology and botany, and the baker's happy-faced Benjamin was a favourite with them. He would stand eagerly listening as they discussed some find, and thus in callow days learned the lesson how patient research yielded secrets only to the persevering. He traced among the ancient beliefs the ancient cures, and from the lore of past times he noted there was even from Adam's day a drug which could cast the quaffers thereof into a deep sleep. From the year he entered college he never ceased to work—keen to acquire knowledge, to be abreast of truth, to reach forward to things that are to come. As a student barely

in his teens, he allowed himself only a few scrimp hours of slumber. The author of *Rab*, watching him leave his publishers wrapped in a sealskin surtout, said: "There is not one man, there are many men, under that coat." Even the *many* could not have borne the strain of constant overwork which finally undermined his strong-built frame, but his eager enthusiasm was such he was bound to die in harness. He found it a relaxation to have a hobby. He liked verse-making, but archæology became his chief diversion. He was a man of encyclopedian knowledge, Professor Masson said, and he amassed this knowledge by never wasting a minute, reading as he drove, or waited at stations, and, moreover, remembering what he read.

Though constantly travelling by road and rail, my father escaped being in any serious accident. A floor of his railway carriage was knocked out by a loose axle, but he put his feet up and sat and read till next stop. He was driven in Edinburgh at great speed, and the police made way for his swift, often galloping, steeds. He had, all the years I knew him, a grim, bad-tempered, devoted coachman, who revelled in the vicious-tempered, fast-going horses Croall kept him supplied with. They bolted coming in from Liberton one morning, and went at a murderous pace. Two policemen at their heads and a dray across the thoroughfare finally stopped their mad career. My father thrust his Jove-like head through the window—"Do go on, *please*; I'll be late for my lecture," he besought his masterful driver, who turned to the crowd and said sadly, "It's awfu' driving a man who doesn't ken he has been run awa' wi', and me all but killed." My father had been sleeping from Liberton, rocked in the swaying carriage, till they were stopped south of Surgeons' Hall. Once, before he had this teetotal but irate Jehu, he started at night for Hopetoun. He awoke and saw lights and houses, and said to himself, "Queensferry." He saw by his watch in the lamplight he had been driving an hour. "If you please, sir," said the coachman, who was *not* sober, "I've been driving round and round as fast as they'll go and can't find a way out. The horses are fair beat." He was hugging the garden railing side of Ainslie Place.

Railway travelling was not the luxurious thing it is now. The arms of the first-class carriages were immovable. He sometimes had to lie down on the floor of the compartment to stretch himself out to sleep, so he often returned stiff and weary and chilled after a journey to take up another day's work. "You've left half your knitted vests behind you somewhere," his servant said reproach-

fully. "No, I haven't," he replied with a twinkle in his eye; "I was so cold in the train last night I opened my bag and put them *all* on, and I've been so busy ever since I arrived I've had no time to take them off, though I am melting." A night in a present-day Flying Scotchman "sleeper" he would have hailed with joy as a place for an uninterrupted rest. We used to amuse ourselves speculating who would get him when he had been absent for a day, there were so many, even on his doorstep, ready to pounce upon him. It was usually a poor person who captured him, for he guessed a Newhaven fisher or a working man would not have sat hours waiting unless it was a case of dire necessity they wished him to relieve.

We had a summer cottage at Trinity, in grassy, secluded grounds overlooking the Forth, for he could drive there for an hour or two of quiet. He said he always felt refreshed with tea, an egg, and a sunset at Viewbank. Many distinguished foreigners he brought down to have a brief but uninterrupted talk there, and take them through the neighbouring quaint fishing village. Sometimes so rapid were his decisions, he left consternation behind him at Queen Street when a dinner party for celebrated guests had been ordered, but judging the weather was settled, and desiring to see the sun sink into the quiet west, he would drive the assembled company off to Viewbank. Cook, food, waiters and appointments had to follow in a long procession of cabs. He would smooth ruffled domestics and hungry guests, who, looking on the Forth, enjoyed their host's flow of soul till the feast was spread anew. He never got flurried, but surmounted difficulties with quick resourcefulness. A bottle of chloroform was spilt, and all were in despair, for no more was obtainable. My father promptly cut out the saturated square of carpet, used it instead of the napkin, and went on with the operation.

He had a strong sense of humour. He found a hearty laugh as refreshing as a sleep. He liked to tease and surprise people. He would open the door and steal in to put a hand over a book on which he saw the reader intent, or stand at the door waiting for someone to look up, greet them with one of his merry smiles, and leave them with a conundrum to puzzle over. He was excluded from the preparation of tableaux to be produced in his own house. He bided his time. The curtain went up for the "Babes in the Wood." Instead of two of his small hostages to fortune, Lyon Playfair and he, in blouses and socks, sucking oranges and crying lustily, walked across the stage. They were loudly encored by a

large audience. "You see I can act," he said to my mother. He took a joke against himself with hearty good will. A horse's mane comb was sent anonymously, with advice to use it well himself and hand it on to Dr. Candlish. He tried it on his tousie head himself, but thinking Dr. Candlish might not like it, bequeathed it to our deer-hound after he had shown it to all comers. He came in to lunch one day asking who was good at problems, for his students had asked him earnestly to answer one. A sealskin greatacoat a patient gave him was the cause of speculation. If a lady's short coat made of a few skins cost £60, how many seals went to make up his? He had no corners someone said, as he was so well padded and round, and he found it convenient at times. He joined the Berwickshire Naturalists to climb Yeavinger Bell to see an ancient fort atop of the hill. He rode up, as this spur of Cheviot was too steep for his overstrained heart, and as he had not ridden since he was a boy delivering his father's bread, he frequently fell off, but being round he said it did not hurt, and laughing, remounted. His carriage was stopped returning to Edinburgh one morning by a man who begged him to come and see his wife. The short-cut down the den of the valley of the Water of Leith where the cottage lay was perilously steep. Time pressed, as he had engagements at College and Infirmary. He sent the carriage round by a bridge to meet him, and *rolled* down the bank, forded the river, and kept his appointments smiling, for he had saved a mother's life. Recollections of his own mother remained green in his memory. He wanted all those he was fond of to be like his mother and his sister Mary. His eldest child, Margaret, he says in a letter, is *really* like Mary. He wrote home to Bathgate that he had been first attracted to my mother by a resemblance he saw in her to his sister. One Sunday as we left Dr. Guthrie's church he waylaid several girls about my size and marshalled us up a long stair in the Netherbow, where in a top flat lay, nigh unto death, a woman from Bathgate who had been to school with my aunt and remembered his mother. We children were silently ranged in a row. "Which is my daughter, think you?" he asked. She at once pointed to me, which pleased him vastly. "I always thought she had a look of *my* Mary's," he said with a satisfied sigh. That opinion of this fellow villager of his was better than most fees to him he said on his way home.

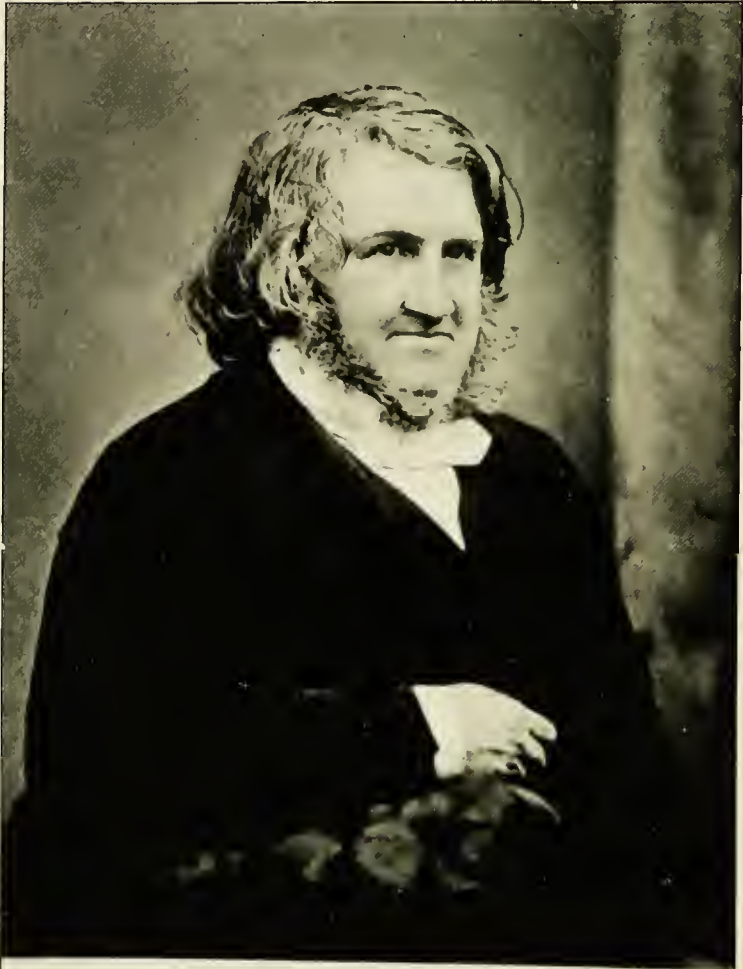
He knew the old town of Edinburgh well, for he visited many sick there. It was said of him he had no acquaintances, for no one spoke with him, or came under his personal influence, who did not

become his friend. Once he took me an expedition late at night through the Grassmarket and its surroundings to see how the rest of the world lived. I felt proud of staying up long after I should have been in bed. Meeting Dog Toby of the Punch and Judy show in private life impressed me. In the same lodging my father sat watching a man who could put a rapier down his throat. We went up many dark stairs into queer corners of "mine own romantic town," the old history of which he knew and explained. Child as I was, accustomed to hearing grateful patients belaud him, it was brought home to me how heartily welcomed, how beloved, my father was by his fellow-citizens in these over-crowded wynds and closes. "The king in a pack of cards might be a portrait of him," said someone, for with his broad build and massive head he was not a man you could pass in a crowd unnoticed; and in the thronged thoroughfares of old Edinburgh all knew, all greeted him. Even in that queer disreputable crowd they smiled and brightened at sight of him, feeling his divine power of sympathy. "I need not tell you," said one of the detectives who was with us, "we are only greeted like this when we've the Professor with us." His presence could change like magic the expression of many, high or low. The dull came to life when he spoke in that peculiarly pleasant voice of his, evil expressions changed for the better. He would come into his own luncheon-room where many waited for him—they were cross and antagonistic. During the Civil War in America Northerners and Southerners met at his house, but before his carriage dashed up to the door and he swiftly entered they scowled one at another. When he stepped in among his guests he was like the leaven which leaveneth the whole. They sat down, North and South, side by side in peace. The pity of it is many who did not need advice, who were pure idlers, or looked upon his house as a fashionable resort, clogged his activities, and interminable bores beset him. He had not the heart to be rude or inhospitable to them, sorely though they tried him. During his last months of illness he was kept to his rooms and saw mostly only his own people, though many were carried up to his rooms for advice, and night and day he worked on at his reforms for hospitals, his hopes to stamp out infectious disease by isolation, as by ancient statutes leprosy had been eradicated.

An eagle with wings spread ready for flight, with the motto *Alis Nutrior*, was the badge that had been borne by Simpsons before his day. My father truly had gained his bread on the wing. When he received a baronetcy (the first offered to a

doctor north of Tweed) he chose for a crest the healing rod of Esculapius, and for his motto one he had earned risking his life to find, *Victo Dolor*. "Tell me," he asked humbly when finally laid aside, "Tell me, don't you think I have done a little work?" His good life, his victory over pain, answered the question.

PLATE III.



J. Y. Simpson

MEMORIES OF SIR JAMES SIMPSON.

By SIR ALEXANDER R. SIMPSON.

To the Editors of the Edinburgh Medical Journal.

52 QUEEN ST., 12th May 1911.

SIRS,—You ask for some memories of my uncle for the June number of the *Journal* that will commemorate the hundredth anniversary of his birth. Take, first, this reminiscent speech of Mr. Imlach, President of the Royal College of Surgeons, at the Jubilee Dinner of the Edinburgh Obstetrical Society:—"There is no one within those four walls, or I may say outside of them either, who has a greater esteem for your Society than I have, and I will tell you the reason why. About the year 1831 there came to our house a young man who was then amanuensis to Dr. John Thomson, the Professor of Pathology in the University of Edinburgh. I do not distinctly recollect his personal appearance at that time, because when you set your eyes on him your attention was at once completely absorbed with the general radiance of his whole expression, and when he tossed back his long black hair with his hand you saw a strong perpendicular cliff of a forehead, and beneath it benevolent, bright, clear eyes, indicating the man of genius and kind sympathy. This young man was James Simpson. Young though I was then, I was irresistibly attracted to him, and the acquaintance thus begun lasted uninterruptedly through a long lifetime.

"I had the great pleasure of seeing this dear friend advance step by step in his career. I saw nearly every paper that he wrote for the medical journals at that early time, as he brought them to our house, not for the sake of any laudation he might get about them—I, for one, being quite incompetent for that—but just for the simple reason that he knew it would give us pleasure to see his work.

"Time went on: he advanced in his profession, and I attended his first course of extra-mural lectures. To show his genial youthful spirit, I well recollect one winter's day when, coming out of the class-room in Surgeons' Square and finding some of us snowballing each other, he joined heart and soul in the play, taking as well as giving with the utmost of his might. I had great pleasure also in being intimately connected with him during

the time of his canvass for the Chair of Midwifery and rendering what little assistance I could for that object, and when the prize was won I felt as if I too had gained something. Gentlemen, time still rolled on and I saw my dear friend rise in the professional and social scale to, I think, the highest position attainable in his profession, the esteem of his fellow-countrymen, and the recognition of his Sovereign.

"Well and in manifold ways did he repay the devotion I felt to his genius, for when it became my turn to start in life no one gave me more encouragement and help than he did, and what little position I may have attained in my branch of the profession I owe in a great measure to him. At last I saw him sicken and die, leaving a great blank, and for a time all looked dull and dreary, but, gentlemen, looking, as I now do, from the quiet of retirement from professional life, I can see amongst you others who are striving well and successfully to maintain the reputation which he achieved for our city and who may some day hold as high a position as he did, and the youngest amongst you who may be spared to stand in my place some thirty or forty years hence may be able to tell a story somewhat like mine. This, gentlemen, is why I will yield to none in esteem for everything connected with your Society and the practice of obstetric medicine."

Again, take this, written for me by Sir Henry Littlejohn, but not at the time made use of, as a supplement for a paper I was preparing for *The Student* four years ago:—

"In the course of a long life I have been privileged to meet many of those distinguished in literature, science, and in my own profession of medicine, but only once in my life have I felt that magnetic something which tells one that he is in the company of a great man. Contact with Sir James Simpson as a professor consultant, or friend invariably quickened one's thought, and even his casual remarks (like those of John Hunter) on any department of medical science opened up lines of investigation fresh and invigorating. I was often struck by his pregnant remarks on questions affecting public health; indeed on any topic he was *facile princeps*, and even in the company of artists and literary men of the highest reputation he held his own. Indeed in every stage of his career he was equal to the occasion, and no one could have guessed that he was not to the manner born. I was witness in Paris to the marked effect of his presence and talk on men like Dubois, Pajot, Jobert, and Depaul. It may be truly said of him, *Nihil tetigit quod non ornavit.*"

I supplement what Sir Henry says of the visit to Paris with what struck Dr. Campbell, who had then a large obstetric practice both among the French and the foreign population and who went with Simpson to a reception in Madame Victor Hugo's salon. "The excitement," Dr. Campbell said, "was something tremendous, and for a time you could hear the sound of ss ss ss running through the room as there passed from mouth to mouth the exclamation, '*C'est Simpson, C'est Simpson.*'"

"The man of genius," said Mr. Imlach. In his *Autobiography* the late Duke of Argyll says: "There have been only four men whom I have come across who have had the enormous brain-case which was conspicuous in Hugh Miller—one was Dr. Thomas Chalmers, another was Sir James Simpson, the third was Hugh Miller, and the fourth was Professor Whewell, Master of Trinity and author of the *History of the Inductive Sciences*. These were all men of more than what we call ability—they were all men of genius" (p. 357). In another place the duke says of Sir James: "I do not know that I have ever met any man in whom genius was written more visibly in face and voice and manner. His spirit seemed to be always quivering in the presence of nature, as if conscious of her immense suggestiveness, and trembling lest he should miss even the slightest of her hints." "I have known two men," said the late Professor Charteris, "whom I could call men of genius—Dr. Norman Macleod and Sir James Simpson." I heard Mr. Edwards, one of our young surgeons, discussing Sir James's amazing activity with an American doctor and asking for an explanation. "It's all," said Dr. Otis, "in that big thinking apparatus of his."

The great brain gave him command of a long and accurate memory. He would recognise at once and greet by name a patient whom he had not seen for years, and recall the nature of her malady. A letter came from Stockton-on-Tees about a child said to be born with a tail. "There's a paragraph I read twenty years ago in Pitcairn's *Criminal Trials* about people with tails," he said to me. "Fetch volume"—I forget whether II. or III. He did not know the exact page, but he remembered that it was near the end of the first third of the book on the left-hand side more than halfway down, and in a second or two his finger was on the passage.

And the brain was in such immediate sympathy with all his senses that I often thought there was as much mind in his forefinger as in my whole constitution. He was keenly sensitive to

sight, to sounds, to all sensations. The scratching, as of a pencil on a slate, that is to many an annoyance, was to him a positive distress. Dr. Skinner, who was for two years his assistant, had an unhappy habit of stirring and stirring away at the bottom of his breakfast cup long after all the sugar must have been melted. Sir James had to tell him how it worried him, but Skinner would sometimes forget, till I saw the distressed patient look on my uncle's face and gave Skinner a little kick below the table. And this reminds me that there was no rancour in his disposition, no bitterness in his rebukes. When he took leave of Skinner I heard him say on his doorstep, "I have sometimes spoken sharply to you, but you'll forgive me." Skinner stayed a minute or two after to say to me, "Was there ever such a man? He never gave me an unnecessary scold, and if he had, the way he said *that* just now would clean blot it out of my memory. I can never think of him but with affection and admiration." To the end he retained his loyal devotion to his old master, notwithstanding that he took to practising homeopathy, the errors and absurdities of which Simpson had exposed in his *Tenets and Tendencies of Homeopathy*.

There was a sunny something about him that made one glad just to see him and that disarmed the criticism with which one might be prepared to meet him. Often and often has a patient, fretting under the delay of a long-expected visit, been ready with words of rebuke and complaint which gave place to a glad welcome when she saw the kindly gleam of the wonderful eyes and succumbed to the witchery of the winning voice. "Do you know your uncle is just fascinating," said a lady to me once, who through some misunderstanding had for a time been estranged from him, but had chanced to meet him again. "I had forgotten how bewitching he could be."

His son, Sir Walter, wrote:—"Watch his carriage as it rattles along the street. He has stepped briskly out before it has had time to stop at the curb-stone. A dwarf in stature, he has the muscle of a giant, the head of Jove himself. In his declining years, it is true, his hand was pressed to his side, his step showed some signs of weariness, but to the last his smile was bright and cheery. As he crosses the pavement to visit a patient he speaks for a moment to a passer-by. The effect is electrical. A few hurried words are all that pass between them, yet the stranger's sullenness vanishes in an instant. The brief interview has converted him into a bright and happy man, such as it would be

a pleasure to know." He goes on to picture an "odd assortment of human beings" gathered in his father's dining-room impatiently waiting his arrival. "The atmosphere is chill like the grave; each guest, eyeing his neighbour suspiciously, shrinks into his own social shell . . . when all at once Simpson bustles in. In a few minutes, under the genial influence of his presence, all tongues are set a-wagging—and well may you ask whether the men who leave his house after luncheon are those who but an hour ago regarded each other with cold disdain, for now they are cordial, kindly, sympathetic; each has been induced to show whatever was attractive in his nature or to give the fruits of his experience."

The eyes that usually beamed with goodwill and often with merriment could, however, shoot fire sometimes. When I was his class-assistant a member of the class made some noise that disturbed the professor. I noticed that he was silent for a second or two and looked at the offender. That was all. In the afternoon one of my companions said to me, "I wish you would tell your uncle not to look like that again. He gave us all a terrible fright, and I thought poor Landes would fall off his seat." He disappointed the class once when it expected to see him look fierce. It has been told me that Syme, having made a bit of a scene in the clinical surgery class-room by denouncing acupressure and tearing up his colleague's pamphlet on the subject, the midwifery class-room was crowded the following day. When the professor came in he just looked round the company with a smile, saying, "Gentlemen, torn arteries don't bleed," and went on with his lecture. Perhaps I have already exhausted your space.

Yours very faithfully,

A. R. SIMPSON.

With the permission of Sir Alexander Simpson we reproduce some portions of an address delivered by him to the Glasgow Gynecological and Obstetrical Society on 19th January 1897, entitled "The Jubilee of Anæsthetic Midwifery," and published in the *Glasgow Medical Journal*.

THE FIRST ANÆSTHETIC LABOUR.

I proposed to your secretary to meet you to-day, because it was on a Tuesday, the 19th of January, fifty years ago, that J. Y. Simpson

first made a woman in labour breathe the vapour of sulphuric ether and delivered her in her sleep. The case and its results were stated publicly on the following day—first to his class in the University, and later in the evening to his brethren in the Obstetrical Society. In the February number of the *Edinburgh Monthly Journal for Medical Science* some details were published; and in “Notes on the Inhalation of Sulphuric Ether in the Practice of Midwifery,” which appeared in the March number of that *Journal*, it is more fully recorded thus:—

“The first case in which I employed the ether vapour occurred on the 19th of January. The pelvis of the mother was greatly contracted in its conjugate diameter from the projection forwards and downwards of the promontory of the sacrum; the lumbar portion of the spine was distorted, and she walked very lamely. The present was her second confinement. Her first labour had been long and difficult; she began to suffer on a Monday, and, after a protracted trial of the long forceps, was at last delivered by craniotomy late on the subsequent Thursday night. Even after the cranium had been fully broken down, a considerable time and much traction had been required to drag the diminished and mutilated head of the infant through the contracted brim of the pelvis, and she was long in recovering. Contrary to the urgent advice of her medical attendant, Mr. Figg, he was not made aware of her present or second pregnancy till she had arrived at nearly the end of the ninth month. It was thus too late to have recourse to the induction of premature labour, which had been strongly pressed upon her as the only means of saving her child, should she again fall in the family way. The pains of her second labour commenced in the forenoon of the 19th. I saw her with Mr. Figg at 5 o’clock in the afternoon, and again at 7 o’clock. The os uteri was pretty well dilated, the liquor amnii not evacuated, the presenting head very high, mobile, and difficult to touch; and a pulsating loop of the umbilical cord was felt floating below it in the unruptured bag of membranes.

“From 5 to 9 o’clock the pains seemed only to push the circle of the os uteri further downwards, without increasing its dilatation or making the head in any degree enter into the pelvic brim. Assisted by Dr. Ziegler, Dr. Keith, and Mr. Figg, I shortly after 9 o’clock made the patient inhale the ether vapour. As she afterwards informed us, she almost immediately came under the anodyne influence of the ether. But in consequence of doubts upon this point, its use was continued for nearly twenty minutes before I proceeded to turn the infant (as I had previously predetermined to do). A knee was easily seized, and the child’s extremities and trunk readily drawn down; but extreme exertion was required in order to extract the head. At length it passed the contracted brim with the anterior part of its right parietal bone deeply indented by pressure against the projecting promontory of the sacrum, and the whole cranium flattened and com-

pressed laterally. The infant gasped several times, but full respiration could not be established. The transverse or biparietal measurement of its head, at the site of the indentation, was, in its compressed state, not more than $2\frac{1}{2}$ inches. Hence we judged the conjugate diameter of the pelvic brim not to exceed this. The infant was large, and rather above the usual size. It weighed 8 lbs. On afterwards examining the head and removing the scalp, no fracture could be found at the seat of the indentation. The thin parietal bone had merely bent inwards.¹

"On questioning the patient after her delivery, she declared that she was quite unconscious of pain during the whole period of the turning and extracting of the infant, or, indeed, from the first minute or two after she first commenced to breathe the ether. The inhalation was discontinued towards the latter part of the operation, and her first recollections on awaking were 'hearing,' but not 'feeling,' the head of the infant 'jerk' from her (to use her own expressions), and subsequently she became more roused by the noise caused by the preparation of a bath for the child. She quickly regained full consciousness, and talked with gratitude and wonderment of her delivery, and her insensibility to the pains of it. Next day I found her very well in all respects. I looked in upon her on the 24th (the fifth day after delivery), and was astonished to find her up and dressed, and she informed me that on the previous day she had walked out of her room to visit her mother. Mr. Figg informs me that her further convalescence has been uninterruptedly good and rapid."

SIMPSON'S FOREBEARS.

The earliest notice of Simpson occurs curiously enough in the first of two volumes, which contain a record of all the cases of midwifery that occurred in the practice of Mr. Dawson, surgeon in the village of Bathgate in West Lothian, where Simpson was born in 1811. It reads—"275. June 7. Simpson, David, baker, Bathgate. Wife, Mary Jarvey, æt. 40. Lab. nat., easy, rapid. 8th child. Son. Natus 8 o'clock P.M. Uti veniebam natus. Paid 10/6."

David Simpson came of a race which in earlier generations furnished moss-troopers for border raids, and in more recent times had earned their bread by the hard toil of farmers, quarrymen, and other like peaceful avocations. David's father was a farmer, shrewd and energetic, and renowned in the countryside for his skill in the management of cattle and their diseases. There was a strong streak of superstition in him that came out in various ways. Thus, when a beggar woman who was wont to be wheeled in a barrow from one part of the parish to another had had her rest and refreshment at Slackend,

¹ The skull and casts of the infant's head are preserved in the Obstetrical Museum in the University of Edinburgh, and were exhibited at the meeting.

he bade a servant lass wheel the old wife away. To his dismay the woman broke out, "I'll hae nae bit hissy like that to hurl me. Gaur ane o' your five braw lads gang wi' me, or it'll be the waur for this hoose." He remembered that his daughter had sprained her ankle when the woman had been round that way before, and taking it into his head that she was a witch, he whipt a sharp piece of flint out of his pocket and drew a gash across her brow, saying, "Ah, I see what ye're noo, ye auld witch; but I've scored ye aboon the braith, and my hoose is safe."

If James Simpson inherited from his paternal forebears the tireless energy, the patient industry, the readiness for conflict, the resourcefulness in emergencies that were to be in him so signally displayed, his mother transmitted to him qualities that were not less needful for the great career before him. Along both lines happily he inherited a reverence for grace and truth, a certain fearless independence of judgment, and that "firm resolve" which Burns apostrophises as "Thou stalk o' carl-bemp in man." But it was from his mother especially that he drew his exquisite sensitiveness to pain and tender sympathy for sufferers, his rare intuition-like power of rapid perception, his deftness of touch, his silvery voice, and the magnetic attractiveness that worked like a spell on multitudes. For Mary Jervay was of Huguenot descent on her father's side, and among her maternal ancestors she counted kin with some of the gentlest of Scottish blood. In particular the family took delight in tracing back their pedigree to James Cleland of that ilk, who was cousin to Sir William Wallace, and one of his henchmen in the Scottish wars with "proud Edward's power," which, happier than his kinsman, he lived to see broken when he followed Bruce to Bannockburn. She was 40 years of age when she gave birth to her seventh son and youngest child, and she continued to suckle him till he was 3 years old; so that when people would be speaking of their earliest memories he sometimes astonished a fitting company by saying he remembered when he was weaned.

HIS BOYHOOD.

In Scotland a seventh son is ever an object of peculiar interest, and the winsome boy who occupied this place in the baker's house seemed at once to bring good fortune with him. Things began to amend in business after he appeared, and the sister who played for many years a mother's part to him proudly foretold his future greatness. As a child he must have been of cherubic innocence. The brother immediately above him in the family would tell how James came to him one day with great glee to show him a halfpenny that his quick eye had discovered under a stone in the corner of Gideon Street. "My, I wouldna like to be you," said David, with a very grave face.

"Glowd-ma-grannie'll hae put it there." (Glowd-ma-grannie was the nickname of the village character who was the terror of the small boys and the butt of the bigger lads of that generation in Bathgate.) "If *he* finds out wha took his bawbee, you'll catch it." The little innocent went and slipped back the coin under the stone, where, of course, David found it by and by. Probably the disappointment was sweetened by one or two of the sugar-balls in which the halfpenny would be invested. That he could acquit himself well in boyish accomplishments may be gathered from the circumstance that when he was careering on stilts once in the gloaming he sent old John Crawford home in a fright, declaring to his household that he had "seen Jamie Simpson's wraith fleeing yont Jervay Street."

The head that, when it came to full development, was to be described, with its long wavy locks, as "Jove-like," was already noted in the youth to be of extraordinary size. When on a visit to his oldest brother at Grangemouth, the village barber there cropped his hair so close that his brother went to remonstrate with the man, who pled that the "callant had sic a muckle heid, I was daein' my best to mak' it look respectable."

STUDENT AND GENERAL PRACTITIONER.

As in many a Scottish homestead where love reigns, some of the older members stinted themselves to secure the education of the bright young brother who was the sunshine of their home. He learnt so much in his native town as to be able to profit by two years' attendance at the arts classes in the University of Edinburgh, and acquired a taste for literature, and especially such a knowledge of Latin as made it a delight for him in after years to hunt through all kinds of antique volumes to find out what had been known in former times on the many matters that came to engage his interest. For whether the subjects he treated of were more general, or more strictly professional, even when he was obtaining some new outlook and moving on to fresh lines of discovery, he was always eager to trace out the way along which the human mind had travelled; and many of his essays thus form a storehouse of reference for the history of their themes.

When he had studied medicine for three years he was able to obtain the diploma of the Royal College of Surgeons at the age of 18, and was thus qualified to apply for a situation as surgeon to the village of Inverkip. He has said that if chosen he would probably have worked on there as a village doctor all his days. That is not at all likely, but we can well believe him when he says—"When not selected, I felt perhaps a deeper amount of chagrin and disappointment than I have ever experienced since that date."

He spent a season in working sometimes with his friend, Dr.

Girdwood, in Falkirk, and more frequently with the family doctor, Mr. Dawson, in Bathgate. The worthy doctor was glad to have his aid in looking after some of his patients and making up their prescriptions, and occasionally got opportunities for him to make the post-mortem examinations which his spirit of scientific investigation prompted him to seek. In one case the old doctor pointed out to him a fistulous opening which had resulted from a central rupture of the perineum during labour, and on the way home remarked that it would have made a fine preparation. "I thought so," said his young assistant, "and I've got it in my pocket." He had a woodcut made of it years afterwards to illustrate his lectures, and here is the preparation still. In making his visits in the country he took note of the antiquities and natural history of the district, and made a special note of a bed of *Senecio saracenicus* growing at Kirkroads, near the site of an old Cistercian monastery—a plant which is said to have only one other habitat in Scotland.

Perhaps his experiences revealed to him that the department of the healing art in which he was most defective was what to a general practitioner is the all-important department of midwifery. He had a keen scientific bent, greatly fostered by association with his fellow-townsmen and room-mate in their college days, Dr. John Reid, who afterwards became Professor of Physiology in St. Andrews; and, as the midwifery lectures were not delivered till between three and four in the afternoon, he told me that, when he attended Professor Hamilton in 1829-30, he regularly went off to sleep. Hence, when he returned to Edinburgh to fit himself for taking the University degree of M.D., he attended three of the courses of lectures given by Dr. Thatcher, one of the extra-mural lecturers who was afterwards a rival in his contest for the chair. With this exception, he had given no special attention to the sphere of medicine with which his name was to be for ever associated, and at the time he attended Thatcher's lectures he was acting as first assistant to Dr. John Gairdner, who said of him that "his abilities and attention promise the most flattering expectations."

HIS FIRST SITUATION.

The subject of the thesis which he had to submit for the obtaining of the doctorate, in 1832, was a pathological one—*De causâ mortis in quibusdam inflammationibus proximâ*—written, according to the custom of the time, in Latin. This thesis fell into the hands of Dr. John Thomson, who had been appointed to the chair of Pathology, founded at his own instance just a year previously. Professor Thomson, father of William and Allen Thomson, who filled with such distinction the chairs respectively of Practice of Physic and Anatomy in the University of Glasgow, was so struck with the ability of the young graduate that

he offered him the position of assistant at a salary of £50 a year. It was his first offer of a definite position and was gladly embraced. He had not only to assist the professor in the arranging of his museum and writing descriptions of his preparations and drawings, but also in the composition of his lectures. On one occasion he had written, at the request of his "chief," part of a lecture dealing with microscopic observations which were then quite novel. His young enthusiasm led him to write strongly of the importance of these researches, and of the light which the use of the microscope was likely to throw on various pathological problems. It was only ready in time for the professor to take into the class-room without previous perusal. Several times as he read the lecture to the class he looked up from his paper to glower at his assistant; and when they got to the side-room he shook his fist in his face, saying, "I don't believe one —— word of it." But though Thomson was sceptical as to the value of the instrument that was to revolutionise his science, he had the shrewdness to recognise the rare gifts of his young assistant, and when he was unable to conduct his course in the session 1837-38, he got Simpson appointed as interim lecturer.

BECOMES OBSTETRICIAN.

He it was who first pointed out that in the sphere of midwifery Simpson would find the most fitting field for the exercise of his faculties; and, through the kindness of Dr. Moir, I can show you the note with which he furnished the student graduate when he advised him to get the profit of another course of the lectures of his colleague, Professor Hamilton. It reads:—

"MY DEAR SIR,—I beg leave to introduce to you the bearer of this note, Dr. James Simpson, an old pupil of your own, who has acted as my amanuensis for a long time. He is desirous to attend your lectures this winter, and I shall feel particularly obliged to you if you will have the goodness to give him a ticket for that purpose, and shall be happy in an opportunity at any time of obliging you in a similar manner.—Yours faithfully,

"JOHN THOMSON.

"80 GEORGE STREET,
19th November 1833."

It was thus not till he had been for more than a year a graduate that he set himself earnestly to master midwifery, and busy though he necessarily was with pathology, by the time he had to read a dissertation to the Royal Medical Society in November 1835, he produced a work on *Diseases of the Placenta*, which is still a classic. In 1838 he began an independent course of lectures on his chosen theme, and felt so confident of success that as the professors entered on one occasion

for the "capping," which he had taken some lady friends to see in the University, he pointed to Professor Hamilton and said, "Do you see that old gentleman?—well, that's my gown." On the 4th of February 1840 the sagacious Town Council gave him the right to wear it, and commissioned him to teach midwifery and the diseases of women and children. When my father told Dr. Dawson of the happy event, the old man only said, "It's all very well to have got his chair. But you know he can never have such a practice as Professor Hamilton. Why, ladies have even been known to come from England to consult him." Happily he lived long enough to see ladies begin to come from the ends of the earth to consult Hamilton's successor.

PROFESSOR OF MIDWIFERY.

When Simpson took up the duties of that chair, it soon became manifest that a master mind had begun to deal with midwifery and the diseases of women. If it has been truly said that "he gave a new life to Obstetric art and science," it may be said that as for Gynecology he presided at its birth. It was born *eo obstetrice*. His genius showed itself (1) in his power of seeing things; (2) in his power of adapting means to ends; and (3) in his power of making others see what he had seen, and do what he had done. Let me illustrate this, first from the obstetric, and then from the gynecological department of his work.

Here is the cast of the head of a child which he helped Dr. Burns to deliver by means of Murphy's craniotomy forceps. After breaking up the skull he left the patient, according to the then common practice, to allow the uterus to recover its tone, and to give time for the commencing swelling of the passages to subside. Returning in a few hours, he found to his surprise that the head had already descended through the narrow brim, and the child was easily extracted. Surely such an occurrence was not novel. But Simpson saw it. He saw that unintentionally he had fractured the occiput close to the foramen magnum. He reasoned that if we could in every case fracture the base of the skull, the extraction of the head would be facilitated, and he set himself to contrive the cranioclast. As soon as he had proved its efficacy he published an account of it, and, as modified by Braun of Vienna, it speedily superseded all previous methods of reduction of the head.

In this jar you see a preparation of a uterus containing a fibrous polypus, the neck of which is in process of separation, resulting in a fatal hæmorrhage. Aided by the sound, which he had not long previously invented, he and his friend Dr. Alexander Wood, who had called him in to see the patient, formed a shrewd guess as to the cause of the patient's floodings; but they were not allowed to use any means to get at the seat of mischief. It would, I presume, be now impossible to

obtain such a preparation, for Simpson saw how that life might have been rescued if only they had had the power of opening up the cervix, and he contrived the now familiar sponge-tent for the purpose. Of course, other methods of dilating the canal have also been employed since then, but until Simpson saw that uterus, and showed how simply such patients could be cured, the writers on female diseases spoke of the *diagnosis* even of intra-uterine polypus as always doubtful, and in most instances impossible. Nothing more easy now both to recognise and to remove. He never kept anything secret that he thought could help his fellows, and it is hard to say whether his delight was greater in finding some new means to cure disease, or in demonstrating to others his methods of treatment.

The note-books of his student days are studded with points of interrogation attached to the dicta of his teachers. After he began to have Nature for his teacher, he questioned her at every turn, and ever and anon she yielded up to him some secret.

HIS VERSATILITY.

Surely there never was another to whom so many practitioners came to get new lessons in the healing art. For more than a quarter of a century, hardly a day, and never a week passed without bringing doctors to the house, to whom he had something fresh to show. The country doctor who came with a patient was shown others with kindred ailments, saw how they were being treated, and went back to his solitary sphere with new confidence and success. The foreign professor, who had been doubtful as to some procedures, came and stayed for a week or two, till he was satisfied of their feasibility, and returned to put them in practice, and teach them to his students. Younger men would come from all quarters, both of the old world and the new, to spend sometimes weeks, and sometimes months together, studying his principles and observing his practice, and then go to propagate them everywhere.

I do not attempt to speak of the work he did outside his profession, in archæology ; in literature ; in politics, local and imperial ; in university and medical reforms ; and in many varieties of philanthropic enterprise. The great brain was never at rest, and found its recreation only in change of interest. Within the range of his profession his interests were not confined to the special department of his chair. Foreigners working in the sphere of surgery sometimes spoke of him as a surgeon. His old master, Professor Thomson, had told the Town Council of his day that he was "fully qualified to conduct the business of the Pathology class ;" and when Alison died in 1854 there were many who wished he would take the chair of Practice of Physic. Ere the day of anæsthesia dawned he had begun to vivify Midwifery and to bring Gynecology into

being as a science. Had he never lulled for woman her travail pangs, his name would still have been written among the immortals in his art. "Gifted," said his colleague, Professor Miller, in 1848, "with talents that are given to few; armed with a zeal and enthusiasm which are absolutely indefatigable; restless and eager, yet withal careful and scrupulous in his research for truth; full of a pure and large-hearted benevolence—he has made many discoveries and improvements in his profession, which are of themselves well capable of transmitting his name safe and honoured to posterity. But all are eclipsed in this his latest and his best. We admire his talents; we praise his zeal; we rejoice in his success; and while we honour his genius, we love the man."

ONE OF HER MAJESTY'S PHYSICIANS.

Before the news came from America that surgical operations might be carried out painlessly on patients narcotised with ether, his high position in the profession had been acknowledged in the highest quarters. Just at that time one of Her Majesty's physicians for Scotland died, and the Duchess of Sutherland, Mistress of the Robes, requested of the Queen to appoint Dr. Simpson to the vacant office. While he was conducting his first anæsthetic labour, this letter from Her Grace was on its way to Edinburgh:—

"STAFFORD HOUSE,
January 18th.

"DEAR SIR,—It was a great pleasure to me to receive yesterday a letter from the Queen, telling me that she should have much pleasure in complying with the request 'which his high character and abilities make him very fit for.' The Queen adds that it will be officially communicated to you.—I remain, Dear Sir, yours very truly,

"HARRIET SUTHERLAND."

The contents of Her Grace's note he communicated to his brother on the Friday following, the 22nd, in a letter which was never meant to be read beyond the family circle, but from which I quote two characteristic sentences:—"Flattery *from the Queen* is perhaps *not* common flattery, but I am far less interested in it than in having delivered a woman this week *without* any pain while inhaling sulphuric ether. I can think of naught else."

PREPARED TO WELCOME DISCOVERY OF ANÆSTHESIA.

This utterance reveals to us a quality which made him welcome with a peculiar eagerness the new discovery, and expend all his energies for its development—that is his delight in the lessening of pain. The great strong brain was matched with a great tender heart. In his student days he was so distressed with the screams and groans of a

poor Highland woman on whom Liston was performing excision of the mamma, that he quitted the Infirmary in sadness, and betook himself to the Parliament House. He thought of seeking work in some writer's office. On further reflection he returned to the scenes of suffering, with the problem pressing on his heart and mind how the pains might be relieved. In lecturing to students or addressing graduates he never wearied in insisting that "the proud mission of the physician is distinctly twofold—viz. to alleviate human suffering as well as to preserve human life." Ten years before the anæsthetic virtue of ether vapour was made known, whilst he was first establishing himself in practice, he made experiments with hypnotism, which Abercrombie, Alison, and other leaders of the profession came to his hospital to see. So when the news reached Edinburgh in 1846 that Liston had performed some operations on patients narcotised with ether, Simpson immediately began to inquire whether in the inhalation of sulphuric ether there might not at length be found the means he had been dreaming of for years of soothing the most agonising pains to which humanity is subject, the pains he had so often to watch with pitying helplessness—the pains of woman in travail.

FIRST MIDWIFERY CASE SELECTED FOR SCIENTIFIC EXPERIMENT.

The idea of surgical anæsthesia was not new. It was easy to believe that a means had at last been found of producing it. But to put to sleep a woman in labour is another and a new idea. In realising it, problems have to be faced that do not meet the surgeon. Bigelow, of Boston, and Liston, of London, for example, had the fancy that the benefits of anæsthesia in surgery would be principally seen in the practice of swift operators who had remarkable powers of execution, and in whose hands the patient would be for the briefest possible space under the influence of the anæsthetic. If it was to be used in midwifery at all it would require prolonged administration. That and other problems had to be met, and ere Simpson entered on the field it is very worthy of note that, eager as he was to prove the virtue of the new anodyne, he was careful to select a case that was fitted to afford a solution of the most important of the problems. The case, as we have seen, was one of deformed pelvis, in regard to which he says, "I had predetermined to extract the child by turning, and to try the inhalation of ether vapour upon the mother, with a view to facilitate that operation. During a week or two previously, I had anxiously waited for the supervention of labour in this patient; for, by the result I expected that much would be decided in regard to ether-inhalation in parturition. Would it merely avert and abrogate the sufferings of the mother without interfering with the uterine contractions? or, would it arrest simultaneously both the contractions of the uterus and the

sufferings that arise from them? As far as the proposed mode of delivery by turning was concerned, it was a matter of no vital importance whether the etherisation stopped the uterine contractions or not. And on this circumstance depended the eligibility of the case for a first trial of ether-inhalation. The result was most satisfactory and most important; for it at once afforded me evidence of the one great fact upon which the whole practice of anæsthesia in midwifery is founded—it proved, namely, that though the *physical sufferings* of the parturient patient could be annulled by the employment of ether-inhalation, yet the *muscular contractions* of the uterus were not necessarily interfered with; or, in other words, that the labour might go on in its course although the sensations of pain usually attendant upon it were for the time being altogether abrogated.”

CONCLUSIONS FROM SERIES OF OBSERVATIONS.

Having satisfied himself from his careful observation of this case that ether could avert the pains without arresting the contractions of the uterus, he proceeded to make application of it in other patients, and at the next meeting of the Obstetrical Society, on 10th February, he was able to give the history of etherisation in some cases of natural labour, and in one forceps case. The inferences that appeared deducible from these observations he stated in the following terms:—

“1. That the inhalation of ether procured for the patient a more or less perfect immunity from the conscious pain and suffering attendant upon labour;

“2. That it did not, however, diminish the strength or regularity of the contractions of the uterus;

“3. That, on the other hand, it apparently (more especially when combined with ergot) sometimes increased them in severity and number;

“4. That the contraction of the uterus after delivery seemed perfect and healthy when it was administered;

“5. That the reflex assistant contractions of the abdominal muscles, &c., were apparently most easily called into action by artificial irritation and pressure on the vagina, &c., when the patient was in an etherised state;

“6. That its employment might not only save the mother from the mere pain in the last stage of labour, but might probably save her also, in some degree, from the occurrence and consequences of the nervous shock attendant upon delivery, and thereby reduce the danger and fatality of childbed; and

“7. Its exhibition did not seem to be injurious to the child.”

In the early experiments the patients were not kept anæsthetised for more than half an hour, but in the course of the three or four

following weeks, he ascertained that anæsthesia could be safely kept up during labour for one, two, three, and even six hours.

SPREAD OF THE PRACTICE.

Having at once, as we have seen, communicated the success of his first experiment to his professional brethren, his example was followed, first in France by Fournier Deschamps, on 27th January, and then by Baron Dubois, who, on 23rd February, reported to the French Academy of Medicine the results of his experience, with the five following conclusions :—

“1. The inhalation of ether can annul the pain of obstetrical operations.

“2. It can suspend the physiological pains of labour.

“3. It destroys neither the uterine contractions nor the contractions of the abdominal muscles.

“4. It diminishes the natural resistance of the perineum.

“5. It does not appear to act unfavourably on the health or life of the infant.”

In London, Dr. Murphy first, on 13th February, and Dr. Prothero Smith in March, took up the practice. In Germany the first case of anæsthetic midwifery occurred on the 24th of February, under the care of Professor Martin, of Jena. “In America,” says Simpson in his report on the early history and progress of anæsthetic midwifery, “the country to which we are indebted for the first knowledge of the anæsthetic effects of sulphuric ether in surgical operations, the same agent was not employed in midwifery till the reports of its use in obstetric practice in Europe had recrossed the Atlantic.” It was on the 7th of April that it was first employed in a case of labour by Dr. Keep, of Boston.

INTEREST OF THE COMMUNITY IN ANÆSTHESIA.

In surgical practice the superinduction of anæsthesia was already meeting with opposition, which became only the more pronounced when it began to be employed in the practice of midwifery. In Edinburgh, in the early days of anæsthesia, many of the citizens found their way to the operating theatre in the Royal Infirmary, “among them,” says Professor Miller, “the great, the good, the singularly humane Chalmers, and it was one of the early triumphs of anæsthesia here to see that man of large and tender heart witnessing a bloody and severe operation with composure and serenity, feeling little because the patient felt not at all.”

OPPOSITION TO ANÆSTHESIA.

But all are not gifted with the open mind and the large heart of a Chalmers. Objections began to be heard on every hand that the novel

practice was unnecessary, was dangerous, was impious, and that no good could come of it; and the loudest and most persistent objectors were found strangely enough among members of the profession, which, through all the ages, had been trying to lessen the sufferings of mankind. On the man who first dared to apply it for the relief of the pains of labour, fell the task of enlightening ignorance, of disarming prejudice, of dispelling superstition, and of vindicating for surgeons and accoucheurs the right to give, and for sufferers to claim, the ease that anæsthesia was calculated to afford.

RELIGIOUS OBJECTIONS.

To some minds it seemed that the proposal to still the sufferings of a parturient woman was to run counter to a divine command. "It has been ordered," wrote a medical opponent of the practice, "that in sorrow shall she bring forth." Simpson wrote a pamphlet in "Answer to the Religious Objections advanced against the Employment of Anæsthetic Agents in Midwifery and Surgery." It is an excellent example of his polemic power, proving from Scripture that the primeval curse as it bore on woman and on the ground was not immutable. He quoted "the sound and excellent Matthew Henry, in his own quaint, pithy, and zealous style," showing "how admirably the satisfaction our Lord Jesus Christ made by His death and sufferings answered the sentence now passed upon our first patient. . . . 'Thus is the plaister as wide as the wound.'" He indicated from the study of the Hebrew roots that to lessen the attendant pain was not to lessen the labour effort that the words seemed to demand. And then he pointed out how the objections raised against the practice of anæsthesia were applicable to improvements in agricultural processes, and had been applied to many discoveries in science and art—even the healing art, as in the case of vaccination. A clergyman spoke of chloroform as "a decoy of Satan," and his friend, George Gilfillan, furnished him with evidence that when fanners first came into use, a clergyman debarred from the communion those members of his flock who used what was termed "the Devil's wind." He was amused to find soon afterwards one of his students, a son of De Quincey, in his graduation thesis rebuking the unmarried ladies who stood up for what they thought was the divine law, and who insisted on their parturient sisters suffering according to the letter, in this fashion:—"The unhappy and wicked woman who remains unmarried appears to break the command herself in four several ways, according to the following tabular statement:—

- "1. She has no conception.
- "2. She brings forth no children.
- "3. Her desire is not to her husband.
- "4. The husband does not rule over her."

It pleased him to find De Quincey himself, in a letter appended to

the thesis of his son, arguing that "if pain, when carried to the stage which we call agony or intense struggle among vital functions, brings with it some danger to life, then it will follow that knowingly to reject a means of mitigating or wholly cancelling the danger, now that such means has been discovered and tested, travels on the road towards suicide. It is even worse than an ordinary movement in that direction ; because it makes God an accomplice, through the Scriptures, in this suicidal movement, nay, the primal instigator to it, by means of a supposed curse interdicting the use of any means whatever (though revealed by Himself) for annulling that curse."

MORAL OBJECTIONS.

Besides the religious objections, there were what he was wont to speak of in his lectures as the moral objections. These in their various expressions were all based on the idea that the practice was unnatural. This idea, pervading the general community, and likely to prevent sufferers from obtaining the benefit of the new discovery, was vigorously championed by the various medical authorities who took it upon them to write down *anæsthesia*. Professor Meigs thought it "unnecessary, as shown by the birth of past myriads." Dr. Merriman spoke of "the great superiority of allowing Nature to conduct the whole process of the birth." Dr. Ashwell decried it as an "unnecessary interference with the providentially arranged process of labour." Dr. Montgomery, the then chief of the great Dublin School of Midwifery, wrote during the session a letter to Edinburgh, in which he said, "I do not believe that anyone in Dublin has as yet used ether in midwifery ; the feeling is very strong against its use in ordinary cases, and merely to avert the ordinary amount of pain which the Almighty has seen fit—and most wisely we cannot doubt—to allot to natural labour, and in this feeling I heartily and entirely concur." I have before me the sheet from his lecture-notes, on which Dr. Montgomery's letter had been copied by Dr. Matthews Duncan, who was then junior assistant to Professor Simpson. Above the words "ether," "midwifery," &c., the professor has marked alternative readings. He would take one of these, suggestive of a doctor making his daily round among his patients, and ask you to imagine Dr. Montgomery writing, "I do not believe that anyone in Dublin has as yet used a carriage in locomotion ; the feeling is very strong against its use in ordinary progression, and merely to avert the ordinary amount of fatigue which the Almighty has seen fit—and most wisely we cannot doubt—to allot to natural walking, and in this feeling I heartily and entirely concur."

MEDICAL OBJECTIONS.

Then there were various objections of a more distinctly medical kind. It was alleged that the use of *anæsthetics* would increase

the mortality of surgical operations. Simpson wrote papers full of laboriously collected statistics, which proved that while before the introduction of anæsthesia, in every 100 cases of amputation of the thigh performed in our hospitals, from 40 to 50 of the patients died, the same amputation when performed upon anæsthetised patients did not prove fatal to more than 25 in the 100 cases; or, in other words, that out of every 100 such operations the previous induction of anæsthesia was the means of preserving 15 or 20 human lives.

When obstetricians alleged that no good was gained by the relief of suffering, and when Meigs, for example, went so far as to speak of pain as "a desirable, salutary, and conservative manifestation of life-force," Simpson turned to the reports of the Dublin Lying-in Hospital, and showed that out of all the women—7050 in number—who were delivered within two hours from the commencement of labour only 22 died, or 1 in every 320; whereas in 452 cases where the labour was prolonged above *twenty* hours, 42 of the mothers died, or 1 in every 11; "a difference," as he said, "enormous in amount and strongly calculated to force us all to think seriously and dispassionately of the effects of severe suffering upon the maternal constitution."

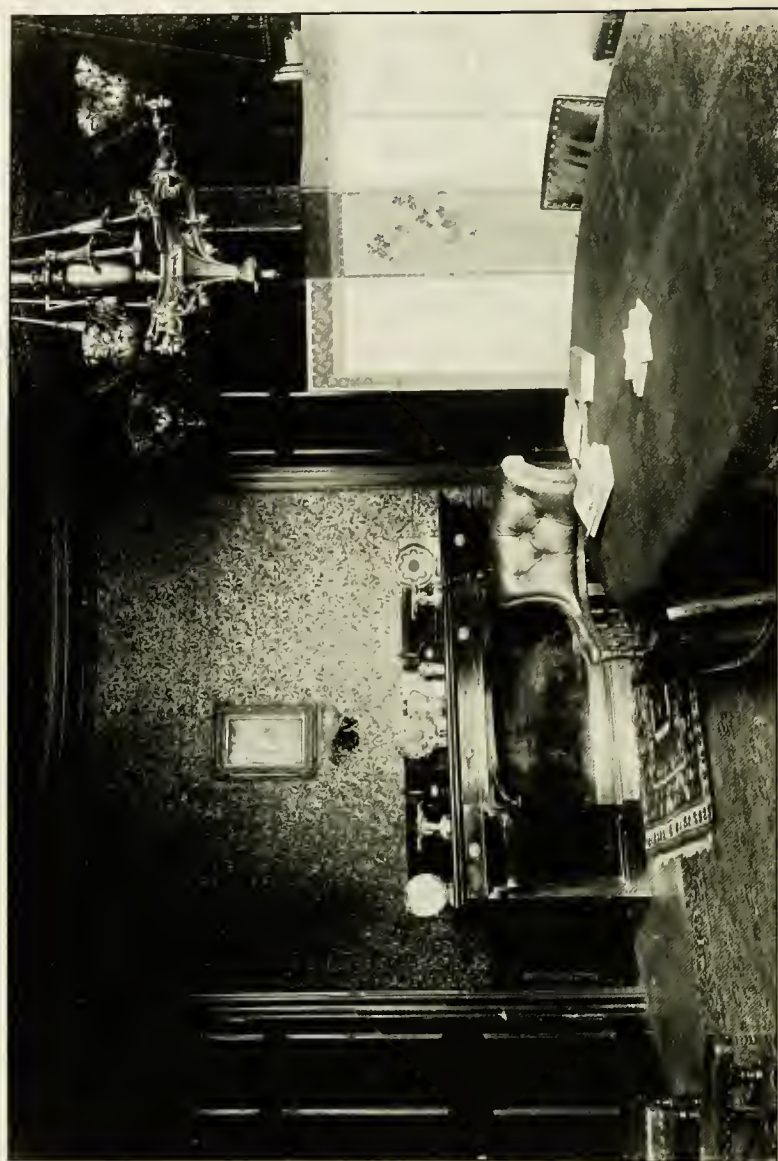
When it was alleged further that the use of anæsthetics might produce mental derangement, convulsions, paralysis, pericarditis, puerperal fever, and other mischiefs, he showed from the results of a constantly widening practice, the futility of such fears; and in regard to some of these complications of labour, and notably in regard to convulsions, experience eventually showed that so far from causing convulsions, the practitioner had been furnished in the administration of chloroform with his most reliable remedy.

The mention of chloroform reminds me that I have been anticipating.

IS SULPHURIC ETHER THE ONLY ANÆSTHETIC?

The mind that had riddled the student note-books with points of interrogation was bound to inquire whether Nature had not concealed among her treasures some other agent that might be possessed of the anæsthetic properties of sulphuric ether, without some of its attendant drawbacks. Ether, he noted, required to be administered in large quantities, especially in protracted cases of labour. It occasionally gave rise to bronchial irritations. Its odour was disagreeable and persistent, and hung for long about an accoucheur who had delivered a woman under its influence. He began to inquire whether other anodyne drugs could not be administered through the lungs, and got the chemists, Duncan, Flockhart & Co., to prepare ethereal tinctures and other vaporisable compounds of various potent sedatives for purposes of experiment. The researches he had made into the history of painless surgery quickened the expectation that other

PLATE IV.



DINING ROOM, No. 52 QUEEN STREET.

(In which Simpson, Matthews Duncan, and George Keith experimented with chloroform.)

gases or volatile liquids might yet prove serviceable. He talked the matter over with various professional friends more conversant with chemistry than himself, with teachers of chemistry, with practical chemists and druggists. He was led to make experiment on the inhalation of various liquids that seemed more fragrant and agreeable than ether, such as acetone, nitrate of oxide of ethyle, benzin, the vapour of iodoform, &c. Professor Gregory suggested chloride of hydrocarbon (Dutch liquid), which he tried on himself with dangerous consequences. Mr. Waldie, a Linlithgowshire friend who was in business as a chemist in Liverpool, suggested the terchloride of formyle. A small quantity of it was procured from Duncan, Flockhart & Co., but it seemed a heavy unvolatile-like liquid, and for the time was set aside. He had Dr. George Keith and Dr. Matthews Duncan as his assistants at the time, and he gladly expressed his indebtedness to them "for the great and hearty zeal with which they constantly aided him in conducting the inquiry." They used to put a teaspoonful of the liquid which they were testing in the bottom of a tumbler, cup, or saucer, or finger-glass. If it was not sufficiently volatile the vessel was placed in hot water. The mouth and nostrils were held over the mouth of the vessel and inhalation slowly proceeded with, and notes taken of the effects.

DISCOVERY OF ANÆSTHETIC VALUE OF CHLOROFORM.

Professor Miller, who lived next door in Queen Street, and looked in nearly every morning at "52" before starting on his rounds at 9 o'clock, has described the circumstances of the eventful evening when chloroform yielded up the secret of its subtle power in a graphic page, which furnishes a trustworthy record of the discovery. It reads:—

"Most of these experiments were performed after the long day's toil was over—at late night or early morn; and when the greater part of mankind were soundly anæsthetised in the arms of common sleep. Late one evening—it was the 4th of November 1847—on returning home after a weary day's labour, Dr. Simpson, with his two friends and assistants, Drs. Keith and J. M. Duncan, sat down to their somewhat hazardous work in Dr. Simpson's dining-room. Having inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material, which he had formerly set aside on a lumber-table, and which, on account of its great weight, he had hitherto regarded as of no likelihood whatever. That happened to be a small bottle of chloroform. It was searched for, and recovered from beneath a heap of waste paper. And, with each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party, they became bright-eyed, very

happy, and very loquacious—expatiating on the delicious aroma of the new fluid. The conversation was of unusual intelligence, and quite charmed the listeners—some ladies of the family and a naval officer, brother-in-law of Dr. Simpson. But suddenly there was a talk of sounds being heard like those of a cotton-mill, louder and louder; a moment more, then all was quiet, and then—a crash. On awakening, Dr. Simpson's first perception was mental—'This is far stronger and better than ether,' said he to himself. His second was, to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm. Hearing a noise, he turned round and saw Dr. Duncan beneath a chair—his jaw dropped, his eyes staring, his head bent half under him; quite unconscious, and snoring in a most determined and alarming manner. More noise still, and much motion. And then his eyes overtook Dr. Keith's feet and legs, making valorous efforts to overturn the supper-table, or more probably to annihilate everything that was on it; I say, more probably, for frequent repetitions of inhalation have confirmed, in the case of my esteemed friend, a character for maniacal and unrestrainable destructiveness, always under chloroform, in the transition stage. By and by, Dr. Simpson having regained his seat, Dr. Duncan having finished his uncomfortable and unrefreshing slumber, and Dr. Keith having come to an arrangement with the table and its contents, the *sederunt* was resumed. Each expressed himself delighted with this new agent; and its inhalation was repeated many times that night—one of the ladies gallantly taking her place and turn at the table—until the supply of chloroform was fairly exhausted."

Miss Agnes Petrie, the niece who shared in the experiment, amused them by folding her arms across her bosom before she fell quite asleep, and exclaiming "I'm an angel! oh, I'm an angel!" They sat up till 3 A.M., after the vial was empty, searching works on chemistry for its composition and best methods of preparation. Next day, Mr. Hunter, of Duncan, Flockhart & Co., began that distillation from a retort, which has grown in the hands of the firm to be one of the great industries of Edinburgh. When a few days later Professor Miller offered Simpson an opportunity of administering chloroform to an infirm patient on whom he was to operate for strangulated hernia. Simpson was unable to attend, and it happened, as has sometimes been seen in other surgical cases, that when the skin had been cut through, the patient fainted and died before the operation had been well begun. On the 10th of November Simpson formally communicated his discovery to the Medico-Chirurgical Society at its first meeting for that session, and when his communication was published, in pamphlet form, with a postscript on 15th November, he was able to announce that he had exhibited the chloroform to about fifty individuals "without the slightest bad result of any kind."

PLATE V.



THE FIRST CHLOROFORM LABOUR.

As was to be expected, one of the first to experience the relief from suffering afforded by the new anæsthetic was a parturient patient ; and he gave at that meeting of the Medico-Chirurgical Society the following history of the case:—

“The lady to whom it was first exhibited during parturition had been previously delivered in the country by perforation of the head of the infant, after a labour of three days’ duration. In this, her second confinement, pains supervened a fortnight before the full time. Three hours and a half after they commenced, and ere the first stage of the labour was completed, I placed her under the influence of the chloroform, by moistening, with half a teaspoonful of the liquid, a pocket handkerchief, rolled up into a funnel shape, and with the broad or open end of the funnel placed over her mouth and nostrils. In consequence of the evaporation of the fluid, it was once more renewed in about ten or twelve minutes. The child was expelled in about twenty-five minutes after the inhalation was begun. The mother subsequently remained longer soporose than commonly happens after ether. The squalling of the child did not, as usual, rouse her; and some minutes elapsed after the placenta was expelled, and after the child was removed by the nurse into another room, before the patient awoke. She then turned round and observed to me that she had ‘enjoyed a very comfortable sleep, and indeed required it, as she was so tired,¹ but would now be more able for the work before her.’ I evaded entering into conversation with her, believing that the most complete possible quietude forms one of the principal secrets for the successful employment of either ether or chloroform. In a little time she again remarked that she was afraid her ‘sleep had stopped the pains.’ Shortly afterwards, her infant was brought in by the nurse from the adjoining room, and it was a matter of no small difficulty to convince the astonished mother that the labour was entirely over, and that the child presented to her was really her ‘own living baby.’”

Seventeen years afterwards his friend, Dr. Adamson, of St. Andrews, sent Simpson this charming photograph that had just been taken by Rogers of a young lady. The accompanying letter told that it was a photograph of the baby of his first chloroform patient, and as you mark the mild angelic air that rests upon the upturned face above the folded bands, you will understand why Dr. Adamson suggested that it might stand for a picture of Anæsthesia, and that it was a pity the girl had not been called by that name.

Simpson believed that he had discovered in chloroform an anæsthetic

¹ “In consequence of extreme anxiety at the unfortunate result of her previous confinement she had slept little or none for one or two nights preceding the commencement of her present accouchement.”

that possessed various important advantages over ether, "particularly in obstetric practice; and that, in particular, it is far more portable, more manageable and powerful, more agreeable to inhale, is less exciting than ether, and gives us far greater control and command over the superinduction of the anæsthetic state." His interest in the new anodyne gave additional zest to the eagerness and energy with which he had set himself to demonstrate the right, and even the duty, of surgeons and accoucheurs to make use of anæsthetic agents; and he did not cease his efforts until he had seen the importance of anæsthesia fairly recognised, and such an impetus given to surgical progress as it had never before received, and such as has only been rivalled since when Lister—praised be the Queen who has raised him to the peerage—inaugurated the Antiseptic Era.

SIMPSON'S GREATEST DISCOVERY.

Any sketch of the man, whose services to anæsthesia we have considered, would be incomplete that took no notice of what was to him the most important incident in his life. One who asked of him in his last days, "What do you consider your greatest discovery?" got for reply—"That I am a sinner, and that Jesus Christ is my Saviour." That discovery came to him on Christmas Day, 1861. One of those great spiritual movements that powerfully influence a community was at that time spreading widely through the land, which had this among other characteristics, that it called out in a remarkable manner all classes of laymen, from nobles to navvies, to take part with the ordained ministers in what were then for the first time described as evangelistic meetings.

We have seen that Simpson's house was a rendezvous for all sorts and conditions of men. The strangest streams of life were constantly flowing through it. Candidates for seats in Parliament or in the Council Chamber of the city, for vacant chairs in the University, for posts in the Infirmary, for lectureships in many schools of medicine, and for pulpits in town or country—all came to seek his advice and bespeak his influence. Antiquaries came with their latest finds; artists and architects sought his opinion of their designs; poets brought him their new poems, and novelists their stories; the Arctic voyager, the African explorer, the traveller from Mecca, missionaries from all parts of heathendom, came with news and gifts of every kind. It could not be but that among the throng there should be some who told him that they had found what his friend, Dr. Hanna, called "the open secret." Salome's son, John, may have been ambitious and of a fiery temper, but he was not a bad man before the day when he heard the Baptist say, "Behold the Lamb of God," and he went and followed Jesus. Mary Jervay's son was not a bad man before that Christmas Day when in prayer with

PLATE VI.



GRAVE OF SIR J. Y. SIMPSON IN WARRISTON CEMETERY, EDINBURGH.

Mrs. Barbour he saw that the babe of Bethlehem had been born to give him second birth. But it was a new man who from that time began to fence his house with family worship; and when I look into the Bible which he bought to read the Scripture from, I find that where the prophet speaks of One "wounded for our transgressions," he has pencilled above the "our" the possessive singular "my." It was consonant with the great-hearted expansiveness of the man, that he began both in private and in public to share his joy with all who cared to taste of it. His conduct has been variously judged. The simple explanation is that the love of Christ constrained him, and when I last heard him address a meeting in the Free Barony of this city in the winter of 1867-68, there was the same note of personal experience and of wonder at "the infinitude of God's love to our fallen race" which marked his first appeals.

The change in his acknowledged relation to God in no way lessened the service he still delighted to render to his fellows, but it variously affected various minds. An Edinburgh gossip asked Miss Catherine Sinclair if she had heard of his conversion, and that excellent lady replied, "If Professor Simpson has been converted, it is time some of the rest of us were seeing if we do not need to be converted." When he presided at an evangelistic meeting addressed by Dr. Hanna, a woman said the sight of the chairman's happy face had done her as much good as a sermon. He went to a meeting of the Royal Society in the company of his life-long friend, Dr. Skae, of Morningside Asylum, and some of the Fellows thought it a good joke to infer that Simpson had gone mad, and to send round the rumour that Skae was looking after him. "And have you read it?" asked Dr. Andrew Wood of Father Rigg, afterwards Bishop of Dunkeld, when he told him that Professor Simpson had given him a copy of his address, entitled *Dead in Trespasses and Sins*. "Yes," said that good Catholic, "I have read every word of it." "Well, what do you think of it?" "It's the production, sir, of a genius."

When Sir David Brewster died in 1868, Sir James Simpson, who had been asked to move the resolution of regret in the Royal Society of Edinburgh, told how he had seen that "archpriest of science passing fearlessly through the valley of death, sustained and gladdened with the all-simple and all-sufficient faith of a very child." His words described to the letter his own departure in 1870; and if, with Sir David's gifted daughter, we try in imagination to follow these great spirits through tracts unknown, and to see on what high quests they fare forth there, we can only say with her of one as of the other—

"We see not, we see not; but this we know,
He has bowed his head with its honours low,
'Not mine! not mine!' is his whisper meet,
As he casts his crown at his Saviour's feet."

SIR JAMES YOUNG SIMPSON'S WORK IN
ARCHÆOLOGY.

By JOSEPH ANDERSON, LL.D.,

Professor of Antiquities to the Royal Scottish Academy.

IT was a striking illustration of Sir J. Y. Simpson's strong personality and many-sidedness that he was able to detach himself at will from the absorbing interests and responsibilities of his professional work in order to engage in the pursuit of some problem in archaeology with all the fervour and enthusiasm of his nature. This course he no doubt adopted from the necessity of obtaining some relaxation from the pressure of professional duties, but the direction of his choice was due to the natural bent of his mind. His interest in the study of antiquities had begun early, and was manifested at first in connection with subjects arising out of his professional studies. Fortunately he did not dissipate his energies on speculative discussions in the general field of archaeology. The tendency of his mind being eminently practical, he was thereby led to direct his attention more immediately to the two sections of the general field which lay nearest to his own personal sympathies—the medical aspect and the Scottish aspect of the study. The services he thus rendered to Scottish archaeology were many, and of supreme importance. His work was always thoroughly scientific in its methods, and distinguished by a determination to make his investigations as complete, exact, and accurate as possible. Hence he never touched a subject which he did not illumine on all sides by laborious research. He joined the Society of Antiquaries of Scotland in 1849, and speedily became one of its most active members, holding office on the council and subsequently as Vice-President. His communications to this and other societies were numerous, and each was a most comprehensive treatise on the subject in hand, in all its aspects and relations. At the first meeting of the Society after his lamented death in 1870, Dr. John Stuart, Secretary, summed up the characteristics of his archaeological work by saying that the many valuable papers which he had contributed would be an enduring monument of his wonderful archaeological attainments, "but those only who had had reason to know the pains which he bestowed on their preparation—his sifting of authorities, his resolution to exhaust every point which could illustrate his subject—could really understand their value."

PLATE VII.



BUST OF SIMPSON, BY PARK.
(Æt. circa 40.)

One of his early efforts in the archæology of a subject connected with medical studies was the "Essay on Leprosy and Leper Hospitals in Scotland and England," communicated to the Medico-Chirurgical Society in 1841 and afterwards printed, first in the *Edinburgh Medical and Surgical Journal*, and latterly in his collected *Essays* edited by Dr. John Stuart, 1872. It is marked by all the characteristics conspicuous in his later work, the thoroughness of his research for contemporary descriptions of the symptoms being curiously illustrated by his finding evidence in the poems of Henryson (c. 1500) which enabled him to diagnose the leprosy of Scotland as the disease known as Greek Elephantiasis. His predilection for the archæological side of medical subjects was subsequently shown in a communication made in 1851 to the *Monthly Journal of Medical Science*, entitled "Notices of Ancient Roman Medicine Stamps Found in Great Britain," containing elaborate descriptions of all the known examples of these "proprietary medicine" stamps, the nature of the medical drugs they indicated, and the ophthalmic disorders for which alone these stamps were used. In 1852 he communicated to the Society of Antiquaries of Scotland a similar paper "On Some Ancient Greek Vases containing Lykion," and in 1856 he printed a pamphlet discussing the question—Was the Roman Army provided with Medical Officers? and reviewing the evidence, literary and monumental, for an affirmative answer, in his usual exhaustive manner. In 1862 he communicated to the Epidemiological Society of London a paper entitled "Antiquarian Notices of Syphilis in Scotland," a singular example of the fertility of a systematic search of contemporary literature and record for all that could be gathered together on a specific subject so obviously unpromising.

By this time his interest in archæological subjects had broadened and deepened, and was no longer confined to the limited circle of professional subjects. In 1857 he read to the Society of Antiquaries of Scotland a paper "On an Old Stone-roofed Cell or Oratory in the Island of Inchcolm." This was a humble structure of unbewn stones built without mortar, and serving as a pig-sty when it first attracted his notice, but the features of its construction, recalling those of the early monastic cells he had seen in Ireland, led him to a more minute examination of it, and to the conviction that it was a construction of a similar early type. Turning, then, to an examination of the early history of the island he found reason to identify it with the cell of the

island hermit mentioned by Fordun as belonging to the service of St. Columba at a little chapel there, and whose hospitality King Alexander I. enjoyed for three days when driven on the island by a storm some time before the year 1123. It is characteristic of his methods that, in discussing the relations of this structure to the oratories of the early Celtic Church in Ireland, he diverged into a dissertation on early Scoto-Irish ecclesiastical architecture, of which the most notable remains in Scotland are the Round Towers of Brechin and Abernethy, and disinterred from the Paris edition of Boece's *Scotorum Historia* (1526) a reference to the Round Tower of Brechin which had hitherto escaped detection, probably because it has been omitted both by Bellenden and Hollinshed in their translations.

In 1860, as Vice-President of the Society, he delivered an inaugural address "On Archaeology, its Past and Present Work," so notable, not only for its masterly grasp and clear statement of the true aims and objects of the science, and the means and methods by which alone they can be attained, that after the lapse of half a century it may be read with interest and profit as practically applicable to the study of Scottish archaeology to-day. In it he pointed out that there were few studies which offer so many tempting fields of observation and comment as archaeology, because the leading object of all its pursuits is man and man's ways and works, from the earliest times at which his traces can be found upon the earth, and that along the whole of his journey of past time he had everywhere left scattered behind and around him innumerable relics forming so many permanent impressions and evidences of his march and progress, which it was the business of the archaeologist to collect, classify, and interpret. The study of these relics, for the reconstruction of the lost history of the past races and nations of men, should naturally possess an interest even more engrossing than that by which the geologist tries to regain the history of the past races and families of the fauna and flora of the ancient world. Formerly the pursuit of archaeology was not unfrequently regarded as little better than a kind of romantic dilettanteism, but the modern inductive archaeology had achieved some notable triumphs of discovery in recent times, and now had as little relation to the antiquarianism of former days as modern chemistry and astronomy have to their prototypes—alchemy and astrology. That Scotland had not lagged behind the other and greater kingdoms of Europe in the cultivation of archaeology

was attested by the rich and valuable Museum of Scottish Antiquities which the Society of Antiquaries of Scotland had gathered together, and had recently made over to the Government as national property. It now behoved every patriotic Scotsman to contribute, so far as it lay in his power, to the enrichment and extension of this great national collection. Single specimens in the hands of private individuals were generally naught but mere matters of idle curiosity, whereas all of them became of use, and sometimes of great moment, when placed in a public collection beside their fellows. "Like stray single words or letters that have dropped from out the Book of Time, they themselves individually reveal nothing, but when placed alongside of other words and letters from the same book, they gradually form, under the fingers of the archaeologist, into lines, and sentences, and paragraphs, which reveal secret and stirring legends of the working of the human mind and human hand in ages of which, perchance, we have no other existing memorials." Giving a whimsical turn to his address by professing envy of the reputed power of the spiritualists, which they put to so little practical use, and supposing that he had the power of calling up the spirits of the bygone ages and thus securing the presence of "a very select and intelligent deputation of Ancient Britons and Caledonians," he would be inclined to cross-examine them upon the hitherto unsolved problems of Scottish archaeology, of which he enumerated no less than sixty awaiting solution. But, while he had no faith in such a summary and supernatural solution of these problems, he did not doubt that many of them would be solved through time, by the ordinary and legitimate means of investigation and induction, carried out upon the principles and methods now recognised by all the sciences.

In 1861 he communicated to the Society of Antiquaries of Scotland a paper "On the Cat-Stane, Kirkliston," afterwards published separately, in which, with his usual wealth of illustrative research but less than his usual cogency of evidence and argument, he suggested that from its inscription it might be inferred to be the monument of the traditionary grandfather of Hengist and Horsa. This suggestion naturally provoked criticism, to which he rejoined that he did not regard the matter as finally settled, although some high authorities had declared in favour of it. In the same year he dealt with a congenial subject by reading a paper "On Some Scottish Magical Charm-Stones and Curing-Stones," in which he instanced many surviving superstitions connected with

the cure of diseases in men and cattle by charm-stones or amulets, of which he described and exhibited three of the most notable—the *Clach-na-Bratach* of the chiefs of Clan Donnachie, the *Clach Diary* of the family of the Stewarts of Ardvoirlich, and the Lee Penny of the Lockharts of Lee—illustrating the subject with his usual comprehensive range of references, from the curing-stone of St. Columba, which was preserved among the treasures of Bruide, King of the Picts, to the more modern examples of snake-stones and adder-beads. In 1864 he contributed a paper “On Ancient Sculpturings of Cups and Concentric Rings on Stones and Rocks in Various Parts in Scotland,” which was afterwards (1867) published in a separate and enlarged form, under the title of *Archaic Sculpturings of Cups and Circles upon Stones and Rocks in Scotland, England, and other Countries*. This volume is still un superseded as an authority on these cryptic sculpturings, and the treatment of the subject forms a model for similar investigations. Beginning with an exhaustive examination of the nature and characteristics of these sculpturings, he divided them into a series of typical varieties, and after enumerating the different classes of ancient monuments on which they occur, tracing them throughout the whole area of the British Isles, and following them in other countries so far as he could find them on record, he summed up the conclusions at which it was possible to arrive by strict induction, without being able to suggest the definite periods of their age or origin, or to explain their purpose or significance. It was surely better frankly to own ignorance than to wander off into vague mystification and conjecture. In following out his personal search for examples of these carvings he had been led by their occurrence in weems or underground houses to search for them in the caves of the seashore near Wemyss in Fife, and found that many such incised sculpturings existed on the walls of these caves, not only of the kind he was in search of, but representations of animals and conventional symbols identical with those occurring on the sculptured stones of Scotland. This discovery he communicated to the Royal Society of Edinburgh in 1866, and an extended notice of the sculptured caves, with copious illustrations, was included by Dr. John Stuart in the preface to the second volume of *The Sculptured Stones of Scotland*. In 1868 he communicated to the Royal Society of Edinburgh a paper entitled “Pyramidal Structures in Egypt and Elsewhere, and the Objects of their Erection,” a revised abstract of which, with additional notes and an appendix,

was afterwards included in the *Essays* edited by Dr. John Stuart under the title, "Is the Great Pyramid of Gizeh a Metrological Monument." Starting from the meaning of the word pyramid, and tracing the analogy between all known sepulchral cairns and the Pyramids, he showed that the type and purpose of them all was the same—that a gigantic sepulchral cairn was an unbuilt pyramid, and that a pyramid was a built sepulchral cairn. All authors, from the Father of History downwards, have agreed in regarding the Pyramids of Egypt as magnificent and royal sepulchres, and sarcophagi have been found in their chambers when first opened. By certain modern writers it has been maintained that the Great Pyramid at Gizeli is not a royal mausoleum but a marvellous metrological monument, constructed for the preservation for all time in its external measurements a standard measure of length, and in the granite coffer or sarcophagus in its interior a standard measure of capacity and weight for all nations. A measure of capacity should surely be itself measurable, but the remarkable thing about this granite coffer was that though it had been measured with the most careful efforts at exactitude by no fewer than twenty-six different observers, their measurements all differed from each other. From this, as well as from the fact that the basal measurements of the Pyramid itself all differed, the futility of the theory that the whole arrangements of the Pyramid had been made with reference to the preservation of standard measures was obvious.

Apart from his writings, however, the influence of his magnetic personality and contagious enthusiasm was perhaps more effective in diffusing a spirit of inquiry among his friends, his students, and even his patients. He interested them all by recommending them to visit the museum, and set many of them working for him by asking for their help in clearing up obscure points which he had met with in the course of his inquiries. This they were always glad and proud to do, some by ransacking the literature of various periods and languages, suited to their tastes or pursuits, and others by verifying and amplifying the descriptions of antiquities in localities to which they had convenient access. Not a few of those he thus inoculated with the love of observation and research did good archæological work on their own account in after years. He occasionally delivered popular lectures on archæological subjects in country towns to delighted audiences, usually choosing for his discourse the antiquities of the near neighbourhood, often familiarly known, but nowise under-

stood, until invested with the wide and wonderful interest which he knew so well how to create in the popular mind. "He was," said Dr. Stuart, "the centre and bond of union of a wide circle of inquirers both at home and abroad, and it was one of his greatest pleasures to bring together, amid the hospitalities of his own house, friends who were engaged in kindred pursuits, while his manifold connections gave him opportunities of obtaining information and kindling research which were never neglected. With all his wonderful powers and acquirements Sir James Simpson was one of the most modest and gentle of men, and it was not saying more than the truth that his removal had deprived us of one of the most valuable and pervading influences in the promotion of archaeological and historical research."

PLATE VIII.

To the Members of the Disputation Committee,

Gentlemen,

I was prevented by a severe indisposition of many weeks duration from reading my dissertation last winter, & I shall in consequence be placed, I believe, very early on the roll for the ensuing session. The subject, or rather subjects on which I was to write were the Structure, Functions & Diseases of the Placenta. After carefully considering these three topics it appears to me, that to discuss them all in a way in any degree satisfactory would require limits greatly more extended than those assigned to an ordinary dissertation. I would therefore humbly beg of you to allow me to restrict my dissertation to the Diseases of the Placenta - a subject on which materials exist amply sufficient for such an Essay.

I am - Gentlemen

Your most Obedt. Servant

Medical Society Hall
24th Sep^r 1835

James Y. Simpson

AUTOGRAPH LETTER WRITTEN BY SIMPSON.
(Now in the possession of the Royal College of Physicians, Edinburgh.)

SIR JAMES SIMPSON'S INFLUENCE ON THE
PROGRESS OF OBSTETRICS.

By SIR HALLIDAY CROOM,
Professor of Midwifery, University of Edinburgh.

To render an adequate record of Simpson's work in obstetrics is a difficult task, because his whole work in medicine, surgery, midwifery, and gynecology is so intertwined that it is not easy to give his purely obstetric work the position which it deserves.

There can be no question at all that his application of ether to obstetrics and his subsequent discovery of chloroform so far outshadow everything in his life, that there is danger of underestimating the value and importance of his obstetric work. To realise, therefore, how the immense impulse that he gave to the study of obstetric medicine became a source of inspiration to so many workers in the department, we have only to recall the relative position of obstetrics when Simpson began, and when he ended his career.

Simpson's introduction to obstetrics seems to have been to a great extent the result of his graduation thesis. This greatly attracted the attention of Dr. John Thomson, the Professor of Pathology, who, in consequence, offered him his assistantship. With him he worked, and occasionally lectured, for some considerable time. Thomson advised him to devote himself to obstetrics, realising that, so far as scientific research work was concerned, it was as yet a practically uncultivated field. Thus in the study of pathology he laid a solid foundation for his work in obstetrics. This was further strengthened by the fact that early in his student career he was a pupil of Goodsir, with whom he had the further advantage of a thorough anatomical training—anatomy and pathology then, as now, being the bed-rock upon which a sound knowledge of obstetrics stands.

His election to the Senior Presidency of the Royal Medical Society gave him the opportunity, at the age of twenty-four, of writing a remarkable paper entitled, "Pathological Observations on the Diseases of the Placenta," a communication which foreshadowed in no obscure manner many of the pathological changes which have been the field of much elaborate investigation and discussion since.

It is needless now to discuss his views upon placentitis, because

these views have been entirely modified and altered since his days. It must be always credited to Simpson that as early as 1836 he suggested that the "fatty" matter frequently found in the placenta might be in reality the result of changes in blood clots, and to him must be credited also the merit of making the first definite attempt to influence the health of the foetus through the maternal blood by the administration of alkaline salts, especially chlorate of potash.

Shortly after that he wrote a striking paper introducing the subject of intra-uterine pathology, the title being, "Peritonitis in the Foetus in Utero." This received but scant attention at the time when Simpson wrote it. The greater portion of it treats of foetal peritonitis in cases where post-mortem examinations had been made on still-born children, and in these cases Simpson rightly attributed the prominent place to syphilis. He first laid down the axiom that when a mother gives birth to several dead children in succession, syphilis may be assumed to be the cause.

In the following year he wrote an additional paper on the "Inflammatory Origin of Some Varieties of Hernia and Malformation of the Foetus."

He was thus a pioneer in the now extensive and abstruse subject of antenatal pathology, which the Edinburgh School of Medicine, through the unwearied labours of Ballantyne, has done everything to elucidate since.

His article on "Hermaphroditism," written about this time, and communicated to the *Encyclopaedia of Medicine*, is, even to this day, a very full and scientific presentation of the subject.

Simpson had been an extra-mural lecturer for three years when Professor Hamilton died, and the Chair of Midwifery became vacant. The story of the contest for this Chair, with its fierce antagonisms, is a matter of history, and need not be again opened up here; it has been fully recorded in various excellent biographies. Sufficient to say that the Town Council of Edinburgh gained for itself endless fame in selecting Simpson for the Chair, and his appointment to it in 1840 was one of the glories of Edinburgh University.

He was twenty-nine years of age at his appointment, and from then till the end of his life his career was one continued success, not only in obstetrics, but in gynecology, in medicine, in surgery, and in archaeology. It is, however, with his obstetric work that this communication is specially concerned.

It must always be kept in mind that the Edinburgh Chair of Midwifery was the very first of its kind, and, as Professor A. R.

Simpson has pointed out in his *History of the Chair of Midwifery*, Joseph Gibson, who was the first occupant, was the first person who ever received the title of Professor of Midwifery. The Town Council in founding the Chair were, as Sir Alexander Grant says, unconscious that they were doing something original, and not following a precedent. Midwifery had always been till then the Cinderella of medicine, neglected and kept back, and its due merits unrecognised. Edinburgh had the honour of being the first university to have a teacher set apart wholly for the purpose of instructing in this most important part of the science of medicine, without which the occupation of all the others would be gone.

The practice of the art also held an unenviable position in the profession, and the practitioners of obstetrics were looked down upon by surgeons as men engaged in an inferior sort of art. The College of Physicians of London and the College of Surgeons of Edinburgh did not examine in midwifery, and it was only in the century that has just closed that a determined effort was made to raise obstetrics to a position worthy of its importance and interests. In 1825 an Obstetrical Society was formed in London, in 1838 in Dublin, and in 1839 in Edinburgh.

The Edinburgh Society originally consisted of twenty members, of whom Simpson was one of the most active and prominent. The Society has been at work ever since, and its meetings have been reported regularly in the *Edinburgh Medical Journal*. In this Society were read many of the most important papers which Simpson's original genius was always pouring forth. From small beginnings the Society has developed into a large Society of influential and active Fellows, regularly publishing transactions of no small scientific interest and value.

Beyond doubt, if Simpson had done nothing else than apply ether to obstetrics, and afterwards discover chloroform, he would have gained for himself imperishable fame in the department. It was in 1847 that he wrote his first pamphlet on chloroform, and it is quite unnecessary after this lapse of time, and with sixty years' experience of it now, that its advantages in midwifery should be discussed.

It is interesting to quote the words of a review of this pamphlet—"And doubtless our good friend Professor Simpson, who must be held responsible for the present sacrilegious attempt to do away with the prime curse on womankind, like a legitimate and faithful son of Apollo and Lucina as he is, was well aware

of this before he set about preaching the crusade of obstetrical etherisation to his brethren. And verily the craft is here in no danger, even if the Professor's most sanguine anticipations should be realised, which we are told go to this extent—that fifty years hence ether will be so universal in midwifery that pain will be the exception not the rule, and that the mothers of future men will bring forth, not in travail and the woe of the mortal couch, but in Elysian dreams on beds of asphodel.”

Anæsthesia, along with antiseptics, has been the foundation of all advances in midwifery. Without these, operative midwifery would have made but very little advancement, and gynecology none at all.

The rules that Simpson laid down for the administration of chloroform in obstetrics have undergone no change during the sixty years it has been in use. For example, “begin towards the end of the first stage, give it during pains, and withdraw it in the intervals. Give small doses or repeat them every second or third pain, when the chloroform affects the action of the heart or uterus. These cases are very rare. As the second stage progresses make the anæsthesia so complete as to destroy all sensibility. Remove chloroform as soon as the child is born.”

His simple handkerchief remains to the present day just as useful and convenient as any of the numerous inhalers. He did not believe that any circumstances should interfere with the full administration of chloroform. He made but one exception, namely, mitral disease of the heart, and he says “this is the only affection where I have the least hesitation in administering chloroform. There is perhaps no necessity for this after all.” It is certain that whatever accidents may have occurred with chloroform in general surgical practice its safety in obstetrics is beyond dispute. Very few indeed are the reports of any serious complication with anæsthesia, even in severe obstetric operations, or the long-continued use of it.

Amongst the more striking of Simpson's works was the persistent war he carried on against the nature and conditions of the lying-in and other hospitals of his time. One cannot but agree that he was actuated by the highest motives in doing so, and that the campaign he carried on was ultimately for their best interests.

If Simpson's contentions and statistics, so laboriously compiled, were true, or anything approaching the truth (and there is no reason to suppose they were not), then his contentions were unanswerable.

In 1848 he wrote in the *Edinburgh Journal*—"There are few or no circumstances which would contribute more to save surgical and obstetric patients from phlebitic and other analogous disorders than a total change in the present system of hospital practice. I have often stated and taught that if our present medical, surgical, and obstetric hospitals were changed from being crowded palaces with a layer of sickness in each flat, into villages or cottages with one, or at most two, patients in each room, a great saving of human life would be effected; and if the village were constructed of iron (as is now sometimes done for other purposes) instead of brick or stone, it could be taken down and rebuilt every few years—a matter apparently of much moment in hospital hygiene."

At the time Simpson wrote there could be no question that there was a greater mortality in hospitals than in out-patient practice, and the question in dispute was whether a high mortality was a necessary adjunct of hospital delivery. In other words, if hospitals were in every respect well managed, would they yield such a high death-rate? The fact remained at any rate that at that time the chances of a woman passing safely through confinement were less likely in hospital than in private practice. Now the condition is exactly the opposite.

It is needless to discuss the question of lying-in hospitals now, because Semmelweiss's discovery and Lister's wonderful work have revolutionised our ideas upon that subject completely, and practically stamped out septicæmia both in general and obstetric hospitals. Nevertheless Simpson's work on hospitalism will remain a monument to his largeness of heart as well as to his enormous industry.

In regard to puerperal sepsis, the teaching of Sir James Simpson was that infection was generally carried by the hands of attendants, and now this is the general opinion. If I were to state that where there was no handling there is no infection, I should not be very far from the truth.

It is remarkable how accurate Simpson's teaching was, and it has been verified to the full by the study of the bacteriology of the vagina and vulva. The work done in this department shows beyond question that the uterus and upper vagina are practically sterile, and that the whole of the micro-organisms are carried from the vulva.

It would be altogether impossible in this short sketch to follow out the evolution of the forceps from the time of Chamberlain, through its modifications by Levret and Smellie

onwards. Some idea of the desire to modify and improve the instrument may be gained by glancing at Witkowski's *Obstetrical Arsenal*, in which are pictured several hundreds of forceps. But there is no question that one of the most eminently practical additions to obstetrics, which can be credited to Simpson, is the introduction, in 1848, of the forceps so long associated with his name, and which, in response to his teaching, has been most commonly employed by those taught in the Edinburgh School. It consists of a pair of long forceps intended and adapted for application either above, at, or below the brim. The features of these forceps are familiar to all of us, and the instrument as constructed by him was a model of what forceps ought to be. It remained so until A. R. Simpson, early realising the principle of axis traction so clearly enunciated by Tarnier, adapted it to the original Simpson's forceps. It is not too much to say that the original Simpson's forceps so modified is the form that appeals most to scientific obstetricians at the present day, and its use as a life-saving instrument has been enormous. With such forceps delivery can be accomplished with scientific accuracy.

Simpson's wonderful ingenuity and powers of accommodating common objects to scientific use were admirably shown in his adaptation of the common "sucker" as an aid to delivery. Although this ingenious contrivance ultimately came to nothing practically, yet it was in itself a remarkable testimony to his rare powers of observation.

A glance at the advancement of obstetrics within the last hundred years does not show the introduction of any very novel operative measures. Indeed, all the operations and interferences at present in vogue were known to the profession a hundred years ago, although they have been marvellously improved, and their mortality strikingly decreased. But great though these improvements have been, no absolutely original instruments have been devised so far as obstetrics is concerned. For the operation of embryulcia Simpson specially devised a greatly improved perforator which has been most generally adopted by the profession since. A closer acquaintance with the mechanism of labour and an early recognition of pelvic deformity has, however, made it possible, for the most part, to avoid, except under unusual circumstances, the sacrificial operation.

There is no more remarkable chapter in the history of obstetrics than Cesarean section. Its origin dates far away back in the mists of the past, and it remained a more or less

discredited operation until the latter half of the last century. Its record within the past four decades has been a brilliant one, and now when this operation is undertaken, where the patient is unexhausted, and the tissues uninterfered with, it can be performed with almost certain safety to both mother and child.

Within recent years the remarkable success which has been associated with the operations for enlarging the bony pelvis, and the endless improvements in manipulations in all forms of obstetric interferences, are such that it is now possible to deal with most obstetric complications and emergencies with comparative safety. Though the names of numberless distinguished obstetricians are associated with the development and perfection of these operations, it would be impossible for a single moment not to acknowledge here the enormous debt the obstetrician owes to Lister. Yet it must remain for ever one of the glories of obstetrics that Simpson's original application of anæsthesia to obstetrics rendered these improvements possible.

Amongst his more important contributions to obstetrics was his resuscitation of the operation of turning as a substitute for craniotomy in narrow pelvis. Although turning in narrow pelvis was no novelty, having been practised long before Simpson's time, yet it had fallen into desuetude, and to him is due the credit, not only of reviving the operation, but of placing it on a sound scientific basis, showing the exact reasons why in a narrow pelvis a child can be born more safely as a footling than in the ordinary way. He recognised for the first time that the foetal cranium is of conical form, enlarging from below upwards, and as the child passes, the narrow part of the wedge enters first; and he further recognised that the narrow bi-temporal part may be artificially adjusted, so that it becomes engaged instead of the bi-parietal.

To prove his contention of the maternal and foetal advantage gained by turning as a substitute for craniotomy he showed from calculations, that the mortality attendant on parturition increases in a ratio progressive with the increased duration of labour. He urged this mortality as one of the strongest arguments against craniotomy, and in favour of turning, the turning being undertaken earlier in labour.

In 1841 Simpson wrote:—"No surgical operation whatever is, abstractly considered, more revolting to human nature than that of craniotomy. It is at the best a dreadful expedient. In too many instances it implies a direct and deliberate murder of a fellow-being by the hand of the accoucheur. It is one of the

operations the propriety or non-propriety of which has engaged all the logical subtlety of metaphysicians."

Simpson established his point, and the use of turning as a method of dealing with a narrow pelvis and saving both the foetal and maternal life was fully recognised and constantly resorted to. Perhaps no communication that Simpson ever made on a purely obstetric subject was worked up with greater elaboration and care than this, and it is only now that, thanks to chloroform and antiseptics, to axis traction, to operations on the bony pelvis, and to the perfecting of abdominal sections, turning for this purpose is less employed than it used to be.

The duration of pregnancy has ever been the subject of much discussion. Simpson went into the matter fully, and those who have heard him lecture will remember his vivid record of the Gardner peerage case, a case that gave rise to so much difference of opinion at the time.

Simpson admits that pregnancy may be protracted, and the evidence seems to be in the main satisfactory; but why it occurs, there is, of course, no absolutely definite knowledge. The most philosophical explanation of the occurrence would appear to be that which attributes impregnation to fertilisation just before the period of menstruation, which it anticipates and prevents. But that does not account for all. It is a subject exceedingly difficult of investigation, owing to the impossibility of getting reliable statistics.

Simpson investigated the well-known observations of Lord Spenser, and one can recall the endless tables of Spenser and Tessier on the possible protraction of gestation. It is in the same communication that he discusses the determining causes of labour, and for the first time propounds his well-known hypothesis of fatty degeneration of the decidua.

Amongst the interesting investigations to which Simpson devoted himself was "the sex of the child as a factor in parturition," and the twelve propositions, which he elaborated from a vast accumulation of statistics, are generally accurate, even to the present time.

Again, in a series of interesting papers he discussed at length the much vexed question of the position of the foetus *in utero*, a point which has engaged the attention of many obstetricians. He propounded the theory that the position of the foetus is due, in the first instance to a succession of reflex or adaptive movements—a theory to which, after trial of many others, the opinion of the profession has again reverted.

His dissertation on placenta prævia must have been a great surprise to the profession of his time, and must have produced a considerable impression. His novel and ingenious proposal that the placenta should be entirely detached was, to say the least, a very bold, as it was certainly a very original, proposal. It gave rise to much discussion at the time, and although this contribution was, as far as observation and reasoning are concerned, one of the most celebrated he ever made, yet it need not be extensively referred to here, for our present knowledge of the placenta and of the anatomy and physiology of the lower uterine segment has entirely altered our views on this important subject.

Simpson as a teacher and lecturer was unrivalled. Those of us who were privileged to listen to him never failed to realise his powers of effortless persuasion, illuminating with sudden and unexpected interest what seemed insignificant details, and fixing a principle by some apt illustration, making it impossible for one to forget it.

What gave weight to his teaching was the immense store of knowledge that lay behind it—knowledge which had been acquired through that capacity for hard work which characterised his life throughout, and was based not so much on the labours of others, as on the patient trustful study of human nature itself. That, I think, which was distinctive of, and gave special character to his teaching, and which no amount of knowledge acquired at first or second hand could have given him, was that indescribable something called genius, and with Simpson genius was vision. His were not so much formal lectures written with studied purpose, but rather eloquent talks in which he came down, as it were, from his chair and sat side by side with his students, and endeavoured to make them see as he saw.

Some of his utterances were almost prophetic, as when once he startled us by his statement that one day not very far distant, by the applications of science, the human body would become diaphanous, a prophecy which has been fulfilled almost to the letter. None of us who heard his last graduation address is ever likely to forget how he foreshadowed not only this, but also had the prescience to foretell what has actually become the case, that in another generation we should be ballooning through the air.

Simpson did not need to seek for words, words came unsought—apt, persuasive, and unforgettable—because he was not explaining a theory, or propounding a speculation, but simply describing what lay clear before his mental vision. And thus it was, that he was

enabled to deal with his subject with such perfect ease, turning it round and looking at it in all its different relations, and finally placing it in the sparkling light of some humorous or pathetic story. He had a great fund of anecdotes, and was an excellent story-teller. Simpson's teaching, for all who heard it, was a possession for ever. One is carried back to a class-room filled to overflowing with an eager crowd of students, amongst whom were a large sprinkling of strangers, many of them not even members of the profession—a feature this, by no means common in classes of literature or art, but surely unique in classes of medicine—of medicine at least in Simpson's department!

Simpson has left behind him no single work on obstetrics. He did not occupy his time with producing volumes, far less text-books. His mind was too prolific, too acute, too active, for the drudgery of books. He had neither the time nor the desire, I presume, to write text-books. His literary work in obstetrics consists of essays and brochures, many of them short, but all of them thorough and complete, and I think one may safely say that his published work contained absolutely no padding. It was the result of his own investigation and was readable through and through. It would have been absolutely impossible for him to have written a book after the German fashion. His essays are all bright, interesting, argumentative, and it is impossible to suppose that one who wrote on so wide a range of subjects, and one who enunciated so many original ideas and theories, could fail to meet with much opposition. Thus it is that his writings are characterised by the endless force and energy which he had always at hand to support his own views. It is needless at this time of day to say that they were models of work, full of ripe experience and widely extensive knowledge of literature. It is wonderful that he wrote as much as he did, because a busier man than Simpson could scarcely be imagined, and in producing as much as he has done one is lost in admiration of his application and powers of perseverance, and of his ability to utilise every moment of his time.

As a pure obstetrician Simpson's reputation rests on three factors:—Firstly, upon his introducing anæsthesia into midwifery, which, after all, was his outstanding glory, and which, as I have already said, overshadows all his other work. Secondly, on the vast field over which his researches extended, and the striking manner in which they affected the obstetric practice of his time. Quite a large number of his communications to midwifery have become

obstetric classics. Thirdly, on his fame as a teacher, on which I have already dwelt.

To my mind, apart from the discovery of chloroform and its application to obstetrics, the greatest, the permanent gift he bequeathed to the profession, was his own keen enthusiasm, which he was able to impart to others. He thus became the founder of a school of obstetricians whose names are indelibly printed on the pages of every obstetric volume.

SIMPSON AS GYNECOLOGIST.

By A. H. FREELAND BARBOUR.

GYNECOLOGY was a new science when Simpson came to it. A first glance does not show the greatness of his contribution, for his was the *Grundwerk*, and foundations never catch the eye.

It had not yet become a specialty, and in estimating the extent of his contribution we must not compare it with that of specialists since, who have been gynecologists and nothing more. Gynecology was only one of many things his genius touched and transformed.

Diagnosis must come before treatment. Simpson saw this, and while he introduced new methods of treatment, his great and lasting contribution was to diagnosis. He found the gynecologist working with only a speculum and the vaginal method of examination, his area of investigation limited by the inadequacy of the instruments. He left him provided with sound, cervical dilator, exploring needle and anaesthesia, which brought within range the *terra incognita* of the uterus and tumours beside it.

There are two kinds of discovery, those bearing on the science and those on the art of a profession. The former is that of something not *known* before, the latter that of something not *done* before. Simpson's discoveries belong to the latter class. He did not discover the sound in the sense of making it, nor was he the first to put it to the specific use of measuring the uterus. Others had done that before, but the sound lay there still unused for they had not been able so to demonstrate its value as to lead to its general use. Here Simpson stepped in. As genius in science gives expression to a thought which may have been in many minds but which no one has put into words, so genius in art, by which we mean applied knowledge, picks up a tool and uses it in such a way that others are constrained to use it also. Thus it happened that before the time of Simpson no British gynecologist used the sound, but after him every one did, and its general use is the best evidence of the importance of the discovery. Genius in art consists not only in seeing the value of a tool but in making others see it also.

In operative gynecology Simpson's name is associated with several minor gynecological operations, and, while major operations were a subsequent development, he saw the great future

PLATE IX.



NO. 52 QUEEN STREET, EDINBURGH.

Between the windows of the centre house there is now the inscription "Sir James Young Simpson lived in this house from 1815 to 1870, and in 1847 discovered the anæsthetic powers of chloroform."

before ovariectomy though he made no contribution to its technique. Yet brilliant and beneficent as the development of that operation has been, were the gynecologist to-day asked whether he would rather have the reputation of having introduced the uterine sound or developed ovariectomy he would undoubtedly say the former.

It is noteworthy and characteristic that Simpson did not write a book. Numerous communications there are, touching on every subject, rich in suggestion, yet he had not the time nor inclination to collect and edit these. Not that he did not appreciate the value of gynecological literature. His papers bristle with references from many languages and from collateral sciences, and often contain allusions to ancient writings which shows his antiquarian bent. Hence, to form an estimate of his work in gynecology we must turn to a collection of his papers made in 1855 by his assistants Priestley and Storer, or to his "Clinical Lectures on the Diseases of Women,"¹ as taken down by his later assistant A. R. Simpson (now Sir Alexander), who succeeded him in the Chair.

Were we to select the most important contributions to gynecological diagnosis and arrange them chronologically, they are:—

1843. "Mémorial on the Uterine Sound."

1844. "Mechanical Dilatation of the Cavity of the Os and Cervix of the Uterus as a Means of Diagnosis and Treatment in some Affections of that Organ."

1848. "On Retroversion of the Unimpregnated Uterus."

1850. "On the Detection and Treatment of Uterine Polypi."

1850. "On the Use of the Exploring Needle in the Diagnosis of Doubtful Forms of Pelvic and other Tumours."

1851. "On Uterine Diagnosis."

1852. "Morbid Deficiency and Morbid Excess in Involution of the Uterus after Delivery."

1855. "On the State of Artificial Anæsthesia as a Means of facilitating Uterine Diagnosis."

Foremost among these we place the monograph on "Uterine Diagnosis." It marked a new era. Till then attention had been concentrated on symptoms, for the obvious reason that there were no methods of physical diagnosis beyond the vaginal examination and speculum. This paper brings out two characteristics of Simpson's work—his appreciation of all that was of value in the past and in the work of other men, coupled with readiness to adopt new methods, and his insistence on the necessity of accurate

¹ Many of them appeared in the *Medical Times and Gazette*, but the complete series was not published till after his death.

observation in clinical work, of which he furnished himself a notable example. Further, we are struck with his appreciation of the findings of pathology and the necessity of a pathological basis—"And first of all I would earnestly beg you to hold this important fact in view, namely, that the diseases of the uterus do not essentially differ in their principles of pathology and treatment from the diseases of other individual organs of the body. . . . Modern pathology has made great advances in the management of uterine disease. These advances, however, have not, let me repeat, consisted so much in finding out that the uterus is the seat of any new or any peculiar affections, as by finding out means and methods by which we can detect and diagnosticate affections that are actually present in it. . . . The great progress in medicine of modern times has consisted not so much in the detection of any new principles of therapeutic treatment as in the detection of appropriate means for enabling the practitioner to detect and discover in different individual organs what the actual diseased actions are."

The "Memoir on the Uterine Sound" is, however, that with which his name will always be associated.

It is difficult now to put ourselves in the position of those whose chief method of gynecological diagnosis was the vaginal examination, whose horizon was limited by the rim of a Fergusson speculum, to whom the uterus was an unknown land. This was the position of gynecological diagnosis in Britain when Simpson appeared. To say that he introduced the uterine sound and with it precision into our knowledge as to the size and position of the uterus may not seem much, and yet it is the foundation stone of gynecological diagnosis as far as the uterus is concerned. Subsequent advances in gynecology have substituted other methods where the sound was the only one. Bimanual examination has enabled us more safely if not more adequately to determine the size and position of the uterus, and asepsis has made the use of the sound an occasional instead of an essential part of examination. Still the fact remains that Simpson extended the field of examination from the vagina and cervix to the uterus, and made it possible to ascertain with precision the size and position of that organ. Further, through the use of this instrument he was led to study the size of the uterus as influenced by the puerperal condition, by tumours and inversion, and its position in retroversion and prolapse. Not that these conditions were not known before from pathology, but he gave the complete clinical demonstration and description.

To say that the "Memoir on the Sound" is a milestone on the road of clinical diagnosis of uterine disease gives no idea of its significance. Rather it stands at a point on the road from which an extensive view of the whole area of physical diagnosis of pelvic disease was first obtained. We can best appreciate the significance of this discovery by quoting the propositions laid down and discussed in the original memoir. After stating that "physical examination as hitherto practised seldom enables us to ascertain accurately the organic condition of more than the cervix and lower part of the body of the uterus," he says: "It is possible by the use of a uterine sound, a bougie introduced into the uterine cavity, to ascertain the exact position and direction of the body and fundus of the organ—to bring these parts of the uterus, in most instances, within the reach of tactile examination, and to ascertain various important circumstances regarding the os, cavity, lining membrane and walls of the viscus."

Then follows a description of the instrument and its mode of use:—"The sound increases to a great degree our power of making a perfect and precise tactile examination of the fundus, body, and cervix of the uterus. By the use of the uterine sound we may, in many instances of pelvic and hypogastric abdominal tumours, ascertain the connection or non-connection of these tumours with the uterus. The uterine bougie is capable of affording valuable diagnostic information by enabling us to measure the length of the uterine cavity."

These propositions are followed by a careful clinical description of the elongation of the puerperal uterus as a sign of delivery, and of the increased length in matritic and congestive hypertrophy of the body of the uterus; of elongation of the cervix; of hypertrophy of the uterus from the growth of fibrous tumours in its parietes or from polypi in its cavity. A preternatural shortness from original malformation, from partial obliteration of the cavity, and from inversion is also described. The subject is illuminated by references to these different pathological conditions gathered from all sources, showing an acquaintance with gynecological literature of all languages and periods which, however familiar to-day, is rarely met with in papers of that period. The state of gynecological knowledge before the days of the sound¹ was often

¹ Simpson never claimed that he was the first to use a uterine probe. In a later paper (1854) he showed that the introduction of a sound into the uterus is repeatedly mentioned in Hippocratic writings, and is alluded to in Avicenna and some Arabian authors, and in the sixteenth and seventeenth

that cleverly expressed by Velpeau—*la doute est la seule opinion rationnelle*.

The use of the sound in the diagnosis of retroversion will be found in a separate paper on "Retroversion of the Unimpregnated Uterus," which appeared in the *Dublin Quarterly Journal of Medical Science* for 1848.

Of the various pathological conditions revealed by the sound, the name of Simpson is specially associated with the description of Sub-involution and of Super-involution. Enlargement of the uterus in its naked-eye pathology had already been described by many writers, but he gave its clinical demonstration, and by the introduction of the term sub-involution related it to its most frequent and significant cause—interference with normal involution. He was the first to describe what he calls a morbid excess of involution or reduction in the uterus after delivery, which he calls super-involution. This condition was unknown to gynecological science until he described it in his paper on "Morbid Deficiency and Morbid Excess in the Involution of the Uterus after Delivery," which appeared in the *Edinburgh Monthly Medical Journal* for August 1852.

Next in importance to the use of the sound comes mechanical dilatation of the cervix, so as to enable the finger to be introduced into the uterine cavity. The sponge-tent had already been used in surgery, but the sponge had been steeped in preparations of wax requiring heat to dissolve the wax and cause expansion. Simpson employed a solution of gum, and the secretion of the canal afforded moisture for the solution of the gum and expansion of the sponge. In his original communication it is not so much the use of the sponge-tent as the desirability and necessity of dilating the cervix so as to get the finger into the uterine cavity which impresses the reader. It is not so much the method that he employed as the demonstration of the possibility and advantages of cervical dilatation in certain cases. Hence, while the sponge-tent has been replaced by other means of dilatation, the discovery of the principle and the necessity of dilatation of the cervix will always be associated with Simpson's name.

In his later paper on the "Detection and Treatment of Uterine Polypi" (which appeared six years after the original paper on the sponge-tent) he shows the value of this principle as applied to the

centuries by other writers. Dr. Mackintosh of Edinburgh previously used it as a mode of treatment, but as a means of physical diagnosis it belongs to Simpson.

detection of intra-uterine polypi, which up to that time had been described "as entirely beyond the reach of legitimate diagnosis and treatment." Patients had died from uterine hæmorrhage whose lives might have been saved. "If art could furnish us with any means of producing at will the same extent of opening of the os uteri [as is found when it has been dilated by a polypus] so as to enable us to feel the 'rounded tumour within' with our finger, we would possess a power of detecting with all the certainty of physical diagnosis the existence of disease within the cavity of the uterus." This Simpson discovered in the sponge-tent. The paper gives a series of cases in which a diagnosis of polypi had been made by this means, and contains an interesting reference to the value of the bimanual examination, which is often spoken of as belonging to a later period. The passage is so important that we quote it in full:—

"In making this examination, as in making most other examinations of the uterus, a rule requires to be followed which is too often forgot, namely, to use both hands for the purpose. For if we are examining the uterus internally with the forefinger or fingers of the right hand, the facility and precision of this examination will be found to be immensely promoted by placing the left hand externally over the hypogastric region so as to enable us by it to steady, or depress, or otherwise operate upon the fundus uteri. The external hand greatly assists the operations of that which is introduced internally; and, further, we can generally measure, between them, the size, relations, &c., of the included uterus."

Of less absolute value now in diagnosis but a new idea at that time was the exploring needle. With the bimanual supplemented by abdominal section to-day we can scarcely realise the significance, to the gynecologist of that time, of this means of determining whether a tumour beside the uterus contained blood, serum, or pus, or was an ovarian cyst. Surgeons had already used the needle for this purpose in cases of doubtful tumours, but its application to gynecological cases we owe to Simpson.

Of a different kind from these three methods of diagnosis but even more far-reaching in its significance to-day is the use of anæsthesia as an aid to gynecological examination. This application of his immortal discovery may not appeal to the imagination as much as the gift to woman in labour of a dreamless sleep, yet it is difficult to exaggerate its value to the gynecologist in cases of doubtful diagnosis due to difficulty in making an examination.

Every now and then cases present themselves in which diagnosis would be impossible without the aid of chloroform.

In laying the foundation of gynecological diagnosis Simpson's contributions stand out clearly defined, and it is easy to select the significant, but when we come to treatment his contributions are so varied and of such unequal merit that we are lost in detail. What strikes one is his resource. Every possible line of treatment was adopted, and every new remedy was tried. Perhaps the most important, apart from gynecological operations, was that of replacing the retroverted or prolapsed uterus and retaining it in position by pessaries. To him we owe the re-position of the retroverted uterus by the sound and its retention, in the first instance, by intra-uterine stem pessaries, for which he subsequently substituted the safer vaginal pessary. It is interesting that the first form of this was made by a patient herself out of gutta-percha, and Simpson was in the habit of using a modification of this instrument until Hodge devised the special form of vaginal pessary with which his name is associated.

The detection of morbid conditions of the uterine mucosa by the sound was naturally followed by the application of caustics to its surface; and various applications were made to the cervix and vagina in the form of medicated pessaries, which he first introduced into practice and which became extensively adopted.

Passing to operative gynecology, we select the following as his most important contributions, again arranged chronologically:—

1841. "On Amputation of the Neck of the Womb."

1844. "Dilatation and Incision of the Cervix Uteri in Cases of Dysmenorrhœa."

1846. "Excision of the Cervix Uteri."

1855. "On the Excision of Large Pedunculated Uterine Polypi."

1864. "Successful Case of Ovariectomy."

Operations for Vesico-Vaginal Fistula and the Removal of the Coccyx in Coccygodynia as described in his Clinical Lectures.

It is interesting to note that one of Simpson's earliest papers was on amputation of the cervix. In 1841 he quotes Dr. Churchill as saying: "I am not aware that any attempts have been made in Great Britain to excise the cervix uteri," and records a case in which he had done it successfully for cancer of the cervix. The operation was done with the patient lying on her face, with the

lower extremities hanging over the bed. The cervix was excised as high up as the reflection of the vagina would permit. The operation was performed in the early months of pregnancy. The patient went to term and lived for many years, giving birth to several children. A careful description is given of the naked-eye and microscopic characters of the tumour. In a later paper he reports on eight more cases and discusses the advantages and limits of the operation.

The treatment of dysmenorrhœa and sterility by dilatation and incision of the cervix is another operation for which we are indebted to Simpson. For its performance he introduced a special instrument, a kind of lithotome caché. The instrument has been discarded but the principle of treatment remains. For the removal of polypi he devised the polypotome. In the operation for vesico-vaginal fistula he employed iron wire sutures, and devised ingenious methods of fixing them so as to secure exact apposition of the margins of the wound.

Of Simpson as a gynecologist we have the finest portrait in his "*Gynecological Lectures*." These were not composed for publication but were taken down as he spoke them, and reveal the greatness of his personality. They differ from his "*Memoir on the Sound*" and other communications in the absence of numerous allusions to the literature of his subject. In the "*Memoir*" there are some seventy-two references to French, German, Italian, and English authorities. On the other hand, the "*Lectures*" are full of allusions to a rich and varied clinical experience.

Schröder, the leading German gynecologist of his day, speaking about Simpson, remarked on hearing how restricted his hospital opportunities were: "What an enormous practice he must have had, and to what good account he turned it!"

It has fallen to few, if to any in this country, to have had the clinical experience he had, and his students got the benefit of it. We know of no series of clinical lectures in gynecology which can be placed alongside of these.

Gynecology stood like a rich harvest field waiting to be reaped, but the instruments had not been provided. Simpson brought these, and such store of corn fell to his scythe that those who followed appear only as gleaners. It was not till abdominal section came in that a like sudden accession to gynecological knowledge was possible. His clinical descriptions of enlargement, atrophy, and displacements of the uterus, of fibroid tumours and cancer, form a classic to which gynecologists will always turn.

Subsequent work has only filled in details chiefly from the domain of microscopic pathology. The clinical picture in its bold outline stands true for all time; it will live because it is true to nature, and has the strength of being work at first hand. It is a faithful picture of what he saw for himself and in some cases was the first to see.

JAMES YOUNG SIMPSON.

AN APPRECIATION OF HIS WORK IN ANÆSTHESIA AND OF
SOME OF HIS OUTSTANDING PAPERS.

By D. BERRY HART, M.D., F.R.C.P., Edinburgh.

“Simpson ist unzweifelhaft der fruchtbarste geistreichste, berühmteste Lehrer der Gynakologie Grossbritanniens, um die Mitte des vorigen Jahrhunderts gewesen, und hat ebensosehr als Lehrer wie als Arzt wie als Operateur, Schüler und Kranke aus allen Teilen der Welt angezogen.”

F. VON WINCKEL, München.

IN the nineteenth century obstetrics advanced along three great lines, and in two at least of these Simpson took a leading part. The first was that of the development of anæsthesia. In the second, the question of puerperal septicæmia and its prevention was the principal theme. In the third, the nature of the advance was more of a general nature—the application of the scientific methods of other branches of science to the clearing up of the various unsolved problems in midwifery. With the second of these the great names are those of Pasteur, Lister, and Semmelweiss; and while Simpson could not be said to have taken the leading part in this investigation, he was at all times highly sympathetic to Semmelweiss's work if not at first to Lister's. He also drew attention, almost at the same time as Semmelweiss, to the contagious nature of puerperal fever and to the analogy between an operation-wound and the bared placental site.

Simpson's position in relation to anæsthesia has been to some extent misunderstood. He was not the enunciator of the general idea of anæsthesia. That really has been in the mind of mankind since the days of Genesis and earlier, and throughout old literature we have allusions to some process by which the surgeon during operation made his patient unconscious. The late Professor Gusserow of Berlin quotes, in relation to Simpson's work, from Middleton's tragedy, *Beware of Women*, published in 1657, the passage—

“I'll imitate the pities of old surgeons to this lost limb, who
Ere they shew their art,
Cast one asleep, then cut the diseased part.”

Humphry Davy drew attention to the anæsthetic effects

of nitrous oxide gas in dentistry, but it is to Morton and Wells of America that we owe the first great step, inasmuch as by means of ether they showed that patients could be fully and safely anaesthetised during a major operation. It cannot be said that in regard to their discovery they took the high professional tone that Simpson did, and therefore when a year afterwards Simpson, after much research and great risk to his own and to his assistants' lives,¹ discovered the convenient and less irritating chloroform, the progress of anaesthesia was accelerated in the most remarkable manner. Simpson proclaimed his discovery at once, especially drew attention to its great use in midwifery, was the first to administer ether and chloroform in labour, and in this way gave an impulse to the progress of the American discovery which has been of incalculable value.

It is remarkable that Simpson, who was afterwards followed in this by Syme and Lister, gave an excellent practical method for the administration of chloroform. He used the open system, gave the drug freely, put the patient well under so as to abolish reflexes, and made the state of the respiration the great guide to the safety of the patient. The principles then laid down still hold good in my opinion, although of course as time passed it was seen that the whole question of its effect on the patient was much more complicated than was at first imagined.

The debatable points soon emerged, and have been and still are the following, namely, what percentage of chloroform vapour should the patient inhale? how far should anaesthesia be pushed during its administration? what are the immediate and ultimate dangerous results to the patient in chloroform inhalation. Lister was one of the first to work at the question of the percentage employed in the open method, and in an article on "Holmes's Surgery" came to the conclusion that under it 4·5 per cent. chloroform vapour was given, a percentage therefore much below the 9·5 per cent. of Snow. This question of the percentage of chloroform vapour necessary has been worked out more recently by Waller and others, and various ingenious apparatus have been constructed to keep the chloroform vapour within the alleged bounds of safety.

In England, anaesthetists early advocated the use of a special apparatus, but while this has continued to be the custom in that country, it has not spread in Scotland, America, or Germany.

¹ Dr. George Keith and Dr. Matthews Duncan were with Simpson when the first experiment with chloroform was made.

This subject will be found ably and impartially discussed by Hewitt, but it is evident that what we want for general practice is a simple method of giving the drug safely by an open system. It would take too long to detail the results of the two Hyderabad Commissions and of Waller's work, but, upon the whole, the open system, the free giving, and watchful attention to the respiration, still form an excellent method of administering chloroform, one that, like very many others in Edinburgh and elsewhere, I have always used and from which I have seen no bad effects.

Many cases of sudden death during chloroform have been recorded, but it has not yet been settled that this is due to the action of chloroform on the nerve centres or on the heart itself. There has been bound up with many of these cases the fact that chloroform has not been fully administered, and that the patient at the time of death showed by some movement that the reflexes had not been properly abolished. This has been drawn attention to by Lander Brunton and others, but even at the present time the risk of the incomplete administration of chloroform, leading to an imperfect abolition of the reflexes as a factor in producing sudden death by shock, is not yet sufficiently grasped.

Undoubtedly the sickness induced by chloroform is in many cases very distressing. The same is noted, of course, after the use of ether, although it is said to be to a less extent. So far as we understand the question it is a result which we have no means of avoiding.

The late effects of chloroform, what is known as delayed chloroform poisoning, have come into prominence within the past few years, and it is an undoubted fact that, although comparatively rarely, such may happen. In many hundred cases I have seen only one, but it is a remote danger that must be kept in mind.

The old dispute of chloroform *versus* ether should be given up. Chloroform has held its own in a very remarkable manner, but new anaesthetics and novel methods of anaesthesia, general and local, are emerging, and to these the scientific practitioner of the day must give his best attention.

It cannot be claimed for chloroform that it is the best anaesthetic. Ether runs it hard, and in the opinion of many is a much safer drug. Be that as it may, chloroform is at any rate the more convenient anaesthetic. It is incomparably better than ether in midwifery and absolutely safe in this branch of our profession, and

if given in it and in surgery with due attention to the breathing, and pushed in major surgery so as to abolish reflexes, it is a drug in which the surgeon and obstetrician can have every confidence.

Simpson's share in anæsthesia, therefore, seems to be that he early appreciated the advantages of Morton's and Wells's discovery; that he was the first to employ ether in obstetrics and to show its use in that branch; that he discovered in chloroform an exceedingly convenient anæsthetic; that he did his utmost to further its use, and by his genius and his able advocacy spread the use of anæsthetics over the world in a way that no other man can be said to have done.

If we try to put into a summarised form the data which we have been discussing regarding the introduction of anæsthetics in America and this country, it appears to me that we might correctly state the whole matter fairly by quoting Simpson's own statement in regard to it.

"1. That on the 11th December 1844 Dr. Wells had, at Hartford, by his own desire and suggestion, one of his upper molar teeth extracted without any pain, in consequence of his having deeply breathed nitrous oxide gas for the purpose, as suggested nearly half a century before by Sir Humphry Davy.

"2. That after having with others proved, in a limited series of cases, the anæsthetic powers of nitrous oxide gas, Dr. Wells proceeded to Boston to lay his discovery before the Medical School and Hospital there, but was unsuccessful in the single attempt which he made, in consequence of the gas-bag being removed too soon, and that he was hooted away by his audience as if the whole matter were an imposition, and was totally discouraged.

"3. That Dr. Wells's former pupil and partner, Dr. Morton of Boston, was present with Dr. Wells when he made his experiments there.

"4. That on the 30th September 1846 Dr. Morton extracted a tooth without any pain, whilst the patient was breathing sulphuric ether, this fact and discovery of itself making a NEW ERA in anæsthetics and in surgery.

"5. That within a few weeks the vapour of sulphuric ether was tried in a number of instances of surgical operations in Boston—Dr. Morton being generally the administrator—and ether vapour was established as a successful anæsthetic in dentistry and surgery.

"6. That in January and the subsequent spring months, 1847, the application of sulphuric ether as an anæsthetic in midwifery

was introduced, described in our medical journals, and fully established in Edinburgh, before any case with it was tried in Boston or America.

"7. That on the 15th November 1847 the anæsthetic effects of chloroform were discovered in Edinburgh, and that it swiftly superseded in Scotland and elsewhere the use of sulphuric ether, and extended rapidly and greatly the practice of anæsthesia in surgery, midwifery, &c."

With the exception of the fact that ether has proved a more formidable rival to chloroform than Simpson at that time thought, what he claims for himself will be agreed to by most scientific men.

If we now take up the third line of advance, namely, the application of scientific methods to the clearing up of disputed problems in midwifery and to the improvement of obstetric operations, Simpson's papers take an exceedingly high place, and his contributions to the practice of version, to the treatment of placenta prævia, and to the questions of hernaphroditism and of the free martin are exceedingly valuable. On each of these I wish to give some estimate in detail.

In version, Simpson's contributions were three in number. He was practically the first man to show the great advantages of the use of the external hand in turning; *secondly*, he was the first to discuss and make a contribution to the question as to which limb should be drawn down in version; and, *thirdly*, he published an exceedingly valuable paper showing the advantages of version as a substitute for craniotomy in labour delayed by obstruction at the brim of the pelvis.

First, *the use of the external hand in version*. Paré in his great discovery as to version introduced the method of turning by passing the hand into the uterus and thus seizing a limb to deliver the child. Simpson showed that the external hand aided the internal hand by steadying the fœtus and working in a combined way with the internal hand. He did not, however, put the matter quite precisely; that was done in this country by a very able obstetrician, the late Dr. Braxton Hicks of London, and his method was still further improved and made clear to the profession by Dr. Robert Barnes in his work on *Obstetric Operations*.

Second, *in the choice of the limb for version*, Simpson was the first to indicate that one limb was preferable, and he wrote an account of the first instance in which he used it, when the famous Martin Barry was his house surgeon. It is interesting to note

that in this case a full dose of opium was given to the patient by Barry before the turning was performed. It has not been generally observed that this case of Simpson's was a dorso-posterior cross-birth, and thus it was the more favourable position for the seizure of the higher limb, a seizure Simpson advocated as being the better in every case. Simpson advocated the higher limb because one could more easily turn, and stated that if one seized the nearer limb it might simply be flexed against the body and turning not effected. Galabin showed quite clearly that one could effect version by either limb, and he advocated the nearer limb as the one to be seized. His diagram is, however, that of dorso-anterior position. Nagel of Berlin showed that we should really seize the limb whose half breech made the small rotation, namely, a quarter of a circle instead of an excursus from the side of the promontory, past the promontory and so to the symphysis. The whole matter seems to me to be summed up in this, that in seizing the limb one must keep in mind the position of the fœtus: in the dorso-posterior position the far limb should be seized, in the dorso-anterior the nearer limb; and thus the rule can be given for seizure of the leg in version where there is any difficulty in the process, namely, "seize that limb which *maintains* or *obtains* the dorso-anterior position."

In the third paper which we are considering, namely, "*Turning as an Alternative for Craniotomy and the Long Forceps*," Simpson made a notable contribution to practice. He did not differentiate in his cases between the flat or flat-rickety and the justo-minor pelvis, but he clearly indicates in his illustrations that the pelvis in which he advocated version was really the flat or flat-rickety. He also did not insist enough upon the limits of the conjugate for turning.

His arguments in favour of turning are most excellent. He insisted on the advantage of the base of the skull, narrower than the vault, entering the narrow conjugate; on the extension of the head bringing the bi-temporal into the conjugate instead of the bi-parietal; and on the aid to the passage of the head afforded by the overlapping of the parietals at the sagittal suture. That in a flat-rickety pelvis, in a multipara, with a conjugate of three and a half to three and three-quarter inches one can deliver more safely than by forceps, I do not entertain the slightest doubt.

The whole question was still more advanced, however, in an exceedingly able and graphic paper, by the late Dr. Goodell of Philadelphia, on "Labor in Narrow Pelvis," read at the Inter-

national Congress at Philadelphia in 1877. Here Goodell differentiated between the justo-minor and the flat-rickety pelvis, showing that the former was the case *ceteris paribus* for forceps, while he again emphasised the advantages of version in the flat-rickety pelvis. Controversy has always raged between the question of version and forceps in the flat-rickety pelvis, and recently the use of the axis-traction forceps has led to the reconsideration of the whole subject. Many hold that if the conjugate is at or a little above three and a half to three and three-quarters in a flat or flat-rickety pelvis, forceps are better than turning; and the late Dr. Milne Murray, who did so much for forceps technique, stated that if forceps were used, the biparietal diameter was not increased as Simpson used to urge, but that the increase in diameter took place in the vertical axis of the skull. I grant that in a pelvis of, say, three and a half to three and three-quarters, or slightly above this, forceps can deliver a fœtus, but I do not agree that an increase of the head takes place in the vertical diameter of the skull and that the head does not telescope anteroposteriorly and therefore dangerously. I have, indeed, seen this telescoping very marked where the forceps had been applied in a flat-rickety case, and possess a cast of the head showing it clearly.

Upon the whole I think the wisest plan is to judge each case on its own merits. In a multipara with the forehead dipping and a conjugate of three and three-quarter inches I think turning gives a better result to both mother and child than forceps.

It is to be noted, however, that there is now a tendency on the part of obstetricians, much to be encouraged, to wait longer when the head is delayed at the brim with a conjugate above a three and a half inch diameter—a disposition to give the woman a little more time, so that the head may be moulded and driven past the obstruction. When once the head has passed or is moulding through the brim, the application of forceps is, of course, a much safer matter. However this question may end, Simpson's papers will always remain the most notable on the subject.

One of Simpson's contributions to which great exception was taken at the time, and over which a fierce controversy raged, was that on the spontaneous expulsion of the placenta before the fœtus, and on the artificial extraction of the placenta before the child in placenta prævia. Simpson was to a certain extent misunderstood, as he only advocated this measure of entire separation in bad cases where the hæmorrhage was great and the parts rigid.

In ordinary cases he recommended the usual treatment adopted at that time, much of which we still employ.

It is interesting to see how Simpson defended his position. He showed that in certain cases the placenta becomes separated and expelled before the child is born. This process is termed prolapsus placenta—a bad term, for which a better has not yet been suggested. This, however, is not the case in placenta prævia alone, as it may happen where the head is presenting and the placenta in normal position. A typical case of this is, for instance, one where the head is arrested at a narrow brim, the labour allowed to go on unduly, and where the practitioner is sometimes astonished to find the placenta expelled into the vagina, although the labour otherwise has made no progress. I have already discussed this question in another place. Prolapsus placenta has thus, I believe, no special significance in regard to placenta prævia alone, and in some of Simpson's cases complications were present, such as transverse presentation, where the compacted and driven-down fetus arrested bleeding. Simpson defended the complete separation on the grounds, firstly, that the hæmorrhage ceased after such a prolapsus of the placenta, and that one reason of the hæmorrhage in placenta prævia was, that when the placenta, was only partly detached, bleeding took place *via* the uterine wall above the separation, through the detached part of the placenta. This is not held to be the case now, for the reason that the separated placental part is thrombosed and this will prevent blood passing. Experimental separation of the placenta in lower animals has also shown that the bleeding comes from the bared uterine wall and not from the separated placental surface. It is to be observed, however, that Bumm of Berlin still gives the separated portion of the placenta in placenta prævia as a source of hæmorrhage. The problem, indeed, could not be solved at that time by any man, however eminent, as the facts in regard to the anatomy of placenta prævia were not fully worked out. It was not known that the placenta was not attached to the cervix in such cases, and there was no knowledge of the differentiation of the uterus into the body proper and the lower uterine segment; the expansion and non-retraction of the lower uterine segment were unknown; and, further, the nature of the blood-vessel walls torn through was not so perfectly established at that time. We are now aware that the placenta is prævia when it is attached, in whole or in part, to the lower uterine segment—the expanding portion during labour—and in addition to the facts already mentioned it has

been ascertained that the walls of the vessels torn through have no muscular fibre but are thin-walled and therefore collapsible. While all this can be pointed out, it is still true that we cannot give a thoroughly good explanation of the arrest of hæmorrhage after separation of the placenta from the lower uterine segment. It was thought at one time (Hofmeier) that the branch to the lower uterine segment passed through the lower portion of the uterine body proper, and this would have helped to explain, in part, the arrest of bleeding; but unfortunately this observation has not been as yet completely substantiated.

Even with his imperfect data Simpson made a very triumphant demonstration of his position, and none of his opponents were able to overturn his arguments.

It may be asked now, What is proposed in modern times for such cases as Simpson tried to treat with complete separation of the placenta? The most recent answer is, by Cesarean section, first performed, curiously enough, by one of Simpson's greatest contemporaries and followers, Lawson Tait. This proposal is, however, rather a cutting of the Gordian knot than a real solution of the difficulty.

Many of Simpson's scientific papers are of a high character, such as those on "Puerperal Arteritis" and on "Albuminuria in Puerperal Convulsions," the latter written after Lever's work, where the quite modern summary given at page 296 of his *Selected Obstetrical Works* was penned in 1847. But probably the two most outstanding contributions are those on the free martin and his classical monograph on Hermaphroditism.

John Hunter was the first to write on the free martin, and his contribution is distinguished by the exactness and force, and swing as it were, of that great anatomist. Simpson took up the question from a purely human obstetrical point of view, discussing the alleged infecundity of females born co-twin with males. In this he showed, first, that there was not a higher average of sterility in such as compared with the ordinary population. He did not notice, however, that when in human twins there is a male and female, they necessarily come from separate fertilised ova: there is no free martin in human twins.¹ As we now know, the free martin in black cattle is usually a defective male, born co-twin with a perfect male, the only difference being that the free martin has defective sexual organs, namely, the epoophoron and the

¹ I think it probable that a single human or bovine free martin may exist, *i.e.* apart from twinning.

hydatid testis with a small portion of the male sexual gland, while the other has perfect sexual and male organs. Simpson concluded that the free martin was one of the strangest and most inexplicable facts to be met with in the study of abnormal development. A distinguished German obstetrician, Spiegelberg, was the first to show that the free martin was a defective male, as he found spermatid tubules in the sex gland, and, in addition, he cleared up the nature of the defective organs. Recent work is tending to explain the whole question, but in regard to this subject the two contributions of greatest value in this country in the nineteenth century were those of Hunter and Simpson, while in Germany Spiegelberg takes the lead, and in Holland a completely forgotten discoverer, Numan, who published in 1843 an atlas on this question, of the very greatest value.¹ Numan did not recognise that the most of the specimens he examined had really testes, but his contribution is an exceedingly able one, and so far as illustration is concerned is much better than any of the others.

In the question of hermaphroditism, Simpson's monograph published in Todd's *Encyclopædia*, an almost forgotten work now, with some exceedingly valuable articles in it by Farre, Richard Owen, and others, is still authoritative, and displays a very great amount of research. We do not as yet see at all clearly through this sexual deformity, the difficulty being that what we mean by sex is not sufficiently defined. It is the presence of an ovum or spermatozoon that alone determines sex. An individual with a sex gland containing spermatozoa is a male, despite the presence of an arrangement of its lower genital tract simulating the female lower tract. There is the very strongest probability that in mammalia a real hermaphroditism cannot exist.² The instance is brought forward sometimes of the existence of an ovotestis, but the condition is not conclusive, as probably what is described as an ovum is merely a separated and degenerated spermatid tubule with a sperm cell in it. I have seen such in the free martin, but to discuss this question in a limited space would be impossible. Simpson's work on Hermaphroditism showed him

¹ A clean uncut copy of Numan's atlas was acquired for the library of the Edinburgh Royal College of Physicians. Spiegelberg knew it through a translation in a Belgian journal without the plates, also in the College library. John Hunter died in 1793.

² Sir Samuel Wilks has always held the existence of a human hermaphrodite as unproved.

possessed of the very highest qualities for pure scientific research, and is still a classic.

Looking back, then, on what has been already said, it may be confidently stated that von Winckel's eulogy is well deserved and accurate, and he might indeed have extended the sphere in which he considers Simpson to have been one of the most eminent discoverers so as to include the Continent of Europe itself.

Scotland may well be proud that in it there should have been born such a man of genius, and that Scottish School and University training should have given this son of her's full scope for his development. Simpson died in his prime, full of honours if not of years, and has left behind him the reputation of one of the greatest of men. He died with his fame unsullied, worn out with strenuous unselfish work, and while the estimation he is held in in all lands is of the very highest, it may be safely predicted that as time goes on it will increase more and more to a perfect appreciation.

SIR JAMES Y. SIMPSON'S CONTRIBUTIONS TO ANTENATAL PATHOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.E.,

Physician to the Edinburgh Royal Maternity and Simpson Memorial Hospital; and Lecturer on Antenatal Pathology in the University of Edinburgh in 1899 and 1900, and in the Polyclinic, Medical Graduates' College, London, in 1900.

SIR JAMES Y. SIMPSON left upon the subject of antenatal pathology the impress of his strong and original mind, and in this respect it did not differ from the other subjects (such as anaesthesia, the arrest of hæmorrhage, hospitalism, &c.) to which he devoted time and attention. He could study nothing in a slight fashion, for he was no dweller in dilettantedom; whatsoever his hand found to do he did it with his might, and his might was considerable. When he approached any subject of study he set forth resolutely along three lines of action and inquiry which hardly ever failed to bring him to novel and weighty conclusions: he collected facts with assiduity, and was not ashamed to go to his professional brethren for their help and advice; he read exhaustively what had been already written by others on the matter; and he then fearlessly drew his deductions and stated them with clearness and force, caring not whether they agreed with or differed from his original presuppositions. It is along such a path that the man must go whose desire is to see his work prospering long after it has left his hands, long after his hands have ceased to do any work.

Sir James Simpson's contributions to antenatal pathology were all made in the early part of his career, and, with a few inconsiderable exceptions, they were all gathered together by Priestley and Storer in the second volume of the *Obstetric Memoirs*, published in 1856, when he had still fourteen years longer of strenuous and fruitful life before him. They constitute a distinct section of that volume, appearing under the heading of "Physiology and Pathology of the Products of Conception," a phrase which finds its equivalent to-day in the shorter title, antenatal physiology and pathology. The latter, however, is a wider term, for it includes not only the health and disease of the fœtus and embryo, and of their annexa (which are, of course, the products of conception), but also of the reproductive cells before they meet in the act of fertilisation. Sir James Simpson did not

indeed shut himself off from the consideration of the ante-conceptional aspect of matters, but heredity and its laws had not in his day taken on the importance or received the elaboration which they now have.

It can be easily understood that investigations into foetal diseases and monstrosities became less and less possible as Simpson's time was more and more filled with the directly practical matters arising out of his epoch-making discoveries in anaesthesia. It is doubtful whether there was any time in his life when he had "quiet doors and unmolested hours," but certainly in his later years the current of life ran rapidly and fully with him above most men and left small opportunity for any but the most pressing and vitally important questions. Yet even in these later and so fully occupied years he found time to add to his notes on such subjects as spontaneous amputations of foetal parts, and the present writer has in his possession some hundreds of pages of his MS. and some dozens of drawings (a gift from his nephew, Sir Alexander Simpson) illustrating this form of antenatal malformation which so greatly interested him.

Sir James Simpson's article on "Hermaphroditism" was prepared for Todd's *Cyclopaedia of Anatomy and Physiology* (vol. ii. pp. 684-738, 1836-39) before his appointment to the Chair of Midwifery in the University of Edinburgh, and the composition of it and the literary research preliminary to that must have both been exacting and prolonged. The result was a monograph which for completeness and insight and clearness of description far surpassed any that had previously appeared on the subject in the English language; it compared favourably with that written about the same time (1836) by the great French teratologist, Isidore Geoffroy Saint-Hilaire; and it has since served as a work of reference for numberless writers, who have drawn freely upon its facts and conclusions. Of course, embryology had not reached the stage of development in 1836 that it has now, and many matters concerned with the appearance, homologies, and analogies of the genital organs were but inaccurately ascertained. Still, Simpson recognised clearly that it was along embryological lines that inquiry must advance, and that it was in arrested development of the sexual organs that an explanation was to be sought of many of the varieties of spurious hermaphroditism. Further, he did something to bring the subject of hermaphroditism out of the position of artificial isolation into which previous writers had inclined to place it when he stated the belief that a key to the

understanding of the early morbid conditions of the reproductive organs would be found in the study of the causes which produced malformations in other parts of the body. He missed, however, the true reading of the facts in the curious case of the free martin, but he did what was perhaps more serviceable at the time, he disabused people's minds of the prejudice that in the human subject females born co-twin with males were sterile. He gathered together information regarding forty-two adult married females who had been born as twins with males, and showed that thirty-six of them were mothers of families, whilst six only had no children—not a high degree of reproductive inadequacy. Further, he recorded the interesting fact that two of the females who had families were each born as a triplet with two males. Sir James Simpson thus once and for all disproved the assertion that women born co-twin with males were free martins and sterile, and whenever this belief has again come to the front (as it has done periodically) it has always been sufficient to refer the anxious inquirer to Simpson's convincing statistics for ease of mind. Had Simpson known that the free martin calf was in many cases a malformed bull he would have been able to bring forward another reason why the aspersion of sterility should not rest upon the female of twins in the human species.

Of late years there has been a great development of our knowledge regarding the psychology of the pseudo-hermaphrodite, and on a somewhat uncertain foundation a whole superstructure of theories regarding the origin of the sexual feelings and the existence of mental hermaphroditism and of moral perversion has been built up. There is nothing of this in the work of Simpson.

Another department of antenatal pathology upon which Sir James's work threw considerable light was that of the production of *spontaneous or intra-uterine amputations of limbs*, and of the reproduction of lost parts. He was not the first to suggest that the umbilical cord, in the form of a constricting coil, was the amputating agent—to Barzellotti (in 1827) that suggestion seems to have been traced—but he did much, with the evidence he was able to collect, to establish the teratogenic powers of the funis, and to place it alongside of the bands of organised lymph of Montgomery as causes of congenital amputations. So strong was the evidence accumulated by Simpson that recent teratologists, whilst expressing great scepticism regarding the power of the umbilical cord to cut through the tissues of a limb, have found much difficulty in explaining away the observations which

had been recorded. Out of the work which Simpson did on spontaneous amputations arose his fascinating hypothesis that the rudimentary digits seen sometimes on the stump were an attempt towards the reproduction of the lost part. This, also, has been criticised, but although seventy years have passed since the suggestion was advanced, it cannot be said to have been disproved, and, of late, experimental teratogenesis has done something to show that the power of reproducing lost parts, even in the higher animals, may be greater than has been supposed. At any rate, Sir James Simpson seems clearly to have grasped the great thought that in antenatal life there exist powers which are not seen in action in adult existence, at least he believed that the absence of any attempt at reproduction of digits in an amputated stump in an adult was not sufficient evidence against such regeneration taking place before birth "in early fetal or embryonic life." The matter deserves far more attention than it has yet received; and the chapter of thirty-six pages in the first volume of Schwalbe's *Morphologie der Missbildungen* is a proof that the importance of regeneration of lost parts in teratogenesis is beginning to be recognised.

Simpson's articles on "Fœtal Peritonitis" and on the "Influence of Inflammation as an Antenatal Cause of Malformations and Monstrosities" contain, as usual, much careful clinical investigation and much shrewd reasoning thereupon. The following passage shows that he saw far into the later developments of the science of teratology:—"The happy idea that was first suggested by the master mind of Harvey, relative to certain malformations consisting, *not* in the *substitution* of an entirely new and anomalous type of structure in the malformed part, but only in the simple *permanence* of some of its transitory fœtal types, has been reduced within the last thirty years, by the able investigations and labours of Wolff, Antenreith, Meckel, Saint-Hilaire, and others, into one of the most certain and comprehensive and at the same time one of the most beautiful laws in teratological anatomy." It was unfortunate that at this stage Simpson failed to distinguish between the morbid processes of fœtal and those of embryonic life, and that he tried to take changes peculiar to the formed tissues and organs of the fœtus and apply them in the explanation of the origin of mal-developments of the forming parts of the embryo. At the same time the rest of his reasoning was sound enough and his outlook was far-sighted when he wrote: "For our own part we entertain little doubt that physiologists will ere long be enabled to proceed

with confidence one step further in investigating and generalising the causes of the production of some of those malformations that are at present attributed, in accordance with the above principle, to deficient or arrested development merely, inasmuch as they will feel themselves entitled to trace, in a certain number of cases at least, the state itself of impeded development to the anterior influence of different inflammatory and other casual pathological conditions of the early embryo." There is now a strong belief that the diseases of the fœtus are one thing and the malformations of the embryo another thing, and that to attempt to explain the latter by the former is to put the cart before the horse. There is a feasible theory which regards deviations in development and arrests of ontogenesis in the embryo as themselves the results of the action of the morbid agent, just as inflammatory and other changes are the result of its action upon the more developed tissues of the fœtus. According to this view the origin of the malformations is anterior to that of the fœtal diseases, such as inflammation, and it must be admitted that this is much more likely than the hypothesis advanced by Simpson. The co-existence of the signs of peritonitis and of various malformations in the infant at birth as an occasional occurrence is undoubted, but it is nowadays regarded as due rather to the fact that a common morbid cause, *e.g.* the syphilitic poison, has acted upon both the embryo and the fœtus than to the inflammatory process having arrested the development of the embryonic tissues. Simpson's contribution to the subject of fœtal peritonitis was admirable, but his attempt to make large generalisations from it in teratology was handicapped by incomplete knowledge of the essential differences between the conditions of fœtal as compared with embryonic existence.

His article on "*Ichthyosis Intra-Uterina*" was a model of what such a contribution should be—clear, concise, complete. Two original cases of a very rare disease were described and figured; similar cases previously reported by other observers, French, German, and Dutch, were summarised and compared; the nature of the morbid condition was considered; and the reasons were given for regarding it as the intra-uterine form of ichthyosis. Further cases of the malady have been described since Simpson read his communications (1843, 1844), but little has been added to our understanding of its nature, and it still retains the name then given to it.

It is difficult to pronounce an opinion upon Simpson's early contribution on "Congestion and Inflammation of the Placenta." It was the dissertation which he read before the Royal Medical Society when he was twenty-four years of age (1835), and probably few obstetricians would now endorse all that was said therein regarding placentitis and its effects. At the same time it opened up new ground and suggested lines of inquiry into the problems of antenatal diagnosis and treatment which were yet to be avenues of advance in knowledge. Specially important were Simpson's speculations concerning the effects of placentitis upon the fœtus. In the paragraphs dealing with that subject it was clearly shown that he had grasped the idea of the paramount importance of the placenta as an organ of the fœtus and the consequent extraordinary danger to the unborn infant which arose whenever the placental tissues became the seat of pathological change. The whole subject evidently remained in Simpson's mind and formed the matter of thought and experiment, for, some ten years later, he was able to deal therewith in a more magistral fashion, and even to report successful treatment based upon the principles he had evolved. Recognising the importance of placental changes as causes of foetal death, and observing that some women repeatedly gave birth to premature dead infants, Simpson resolved to try to treat medicinally not the unborn infant but its placenta. Starting with the assumption that an imperfect placenta was equivalent to imperfect lungs, he resolved to endeavour to make the mother's blood so full of oxygen that the small part of placenta which remained capable of healthy functioning would suffice, by means of the highly oxygenated character of the blood circulating in it, to keep the fœtus in life until it was of an age when it might be withdrawn from the uterine interior into the outer world, where, of course, the special intra-uterine and placental dangers would no longer pursue it.

Whether or not we believe that he succeeded in doing this by means of chlorate of potash, or whether we regard the good effect which often followed as due to another kind of action of the chlorate or no, there remains no doubt that a beginning was here made with a rational form of antenatal therapeutics, the full significance of which has hardly yet been noted. A sentence from Simpson's work was the starting-point for an experiment in antenatal therapeutics which I have now made in several cases. He wrote: "Would the use of chalybeates, or other means, ever so invigorate the child as to prevent those placental diseases—such as

fatty degeneration—which may possibly be connected with want of power in the fetal economy and circulation?" I believe good has followed the continued administration of iron and chloride of calcium to pregnant women who had lost all their previous infants through antenatal death, and I had occasion to point out to the post-graduate students attending my clinics at the Royal Maternity and Simpson Memorial Hospital last autumn a case undergoing treatment of this kind. The mother was successfully delivered of her first living infant during the month of October. It is true that antenatal therapeutics has made no very wonderful advances since Simpson's time, but for that he cannot be made to bear the blame. He did his best to open up a path for future explorers, he collected data and he made experiment, and he left the matter with the statement, "it is quite open for inquiry."

It is remarkable that even in some of Sir James Simpson's short notes on specimens shown at meetings of the Edinburgh Obstetrical Society and elsewhere one comes across fragments of thought of very considerable value, and I may fittingly bring this appreciation to an end by quoting what he said about a specimen of "hydatid ovum" in 1847: "The alleged hydatids were, no doubt, merely the enlarged villi of the chorion. So far, the affection was a kind of *malformation* from arrest of development, the villi of the chorion remaining of their early embryonic type, and continuing to increase and grow under this retained type of structure, but the cells of the villi, constituting the hydatid placenta, appeared at the same time to be generally broken up in their internal tissues, and distended by a morbid accumulation of fluid, so that we have *disease* added to malformation, and dropsy co-existing with the hypertrophied state of these structures. It would be difficult to decide whether the dropsy stood in the relation of cause or effect to the malformation, or whether both were not the effects of some common cause." The most modern views on hydatidiform degeneration of the chorion and the syncytial covering of the villi stand at no great distance from the opinion thus laid down by Simpson incidentally when showing a specimen at a meeting of the Society whose President he was from 1841 to 1858.

LIFE AND ITS EPIPHANIES.

THE ADDRESS TO THE HARVEIAN SOCIETY OF EDINBURGH

By Emeritus-Professor SIR ALEXANDER RUSSELL SIMPSON,
M.D., D.Sc., LL.D., President of the Society for 1911.

GENTLEMEN—FELLOW-HARVEIANS,—The man, the spell of whose genius and character and toil gathers us in festive commemoration of his birth three hundred and thirty-three years ago—Dr. William Harvey—was profoundly interested in Life, its source, and its course. We, who are proud to be members of his profession, share this interest. It could not be otherwise with those who are set in their communities to act as watchmen at the gates of life, who are called to attend when a new life comes to seek a line in a people's census, and again when a certificate is required to tell the registrar how the life has passed away. It will always become Harveians to consider Life and its Epiphanies.

"BETWIXT THE VISIBLE AND THE INVISIBLE."

It is not in his greatest and best-known work—*On the Motion of the Heart and Blood*—that we find Harvey's fullest thought on Life. Yet in it already he lets us see him exercising his clear vision and his far-seeing imagination on "a bloody point so small that it disappeared during the contraction and escaped the sight, but in the relaxation it reappeared again, red and like the point of a pin; so that betwixt the visible and the invisible, betwixt being and not-being, as it were, it gave by its pulses a kind of representation of the commencement of life" (Sydenham Society edition of his works, p. 30). We like to find the man to whom it was given to discover and demonstrate the action and use of the heart, giving in all his writings a regal place in the economy to what he has taught us to regard as its central organ. He speaks of it as "the beginning of life; the sun of the microcosm, even as the sun in his turn might well be designated the heart of the world" (p. 47). Again, "the heart, like the prince in a kingdom, in whose hands lie the chief and highest authority, rules over all; it is the original and foundation from which all power is derived, on which all power depends in the animal body" (p. 83). In his first chapter he says: "When I first gave my mind to vivisections

as a means of discovering the motions and uses of the heart, and sought to discover these from actual inspection, and not from the writings of others, I found the task so truly arduous, so full of difficulties, that I was almost tempted to think with Fracastorius, that the motion of the heart was only to be comprehended by God" (p. 19). When, after his much reading and reflection and long research, the beautiful truth became clear to him that the blood is driven in a circle through the body, he lets us see that "the household divinity," as he calls the heart, is not self-produced or there by chance, for in the last chapter of his famous treatise he bids us note that "Nature, ever perfect and divine, doing nothing in vain, has neither given a heart where it was not required, nor produced it before its office had become necessary; but by the same stages in the development of every animal, passing through the constitutions of all, as I may say (ovum, worm, fetus), it acquires perfection in each" (p. 82). He was an Evolutionary before Darwin.

"THE DIVINE ARCHITECT."

It is in his less read work on animal Generation that we come more closely on his thoughts on the problems of existence. Each Harveian, as he comes on these thoughts of the Master, recognises that they are the expressions of one of the sanest of minds. He will have nothing to do with the way of "the vulgar and unlettered," who, "when they do not comprehend the causes of various effects, refer them to the immediate interposition of the Deity" (Letter to Riolanus, 120). No more will he be associated with philosophers who teach that "all things may be produced from nothing" (p. 32); or again, who "assign a material cause for generation, and deduce the causes of natural things either from the elements concurring spontaneously or accidentally, or from atoms variously arranged. They do not attain," he goes on to say, "to that which is first in the operations of Nature and in the generation and nutrition of animals, viz. they do not recognise that efficient cause and divinity of Nature which works at all times with consummate art, and providence, and wisdom, and ever for a certain purpose and to some good end; they derogate from the honour of the Divine Architect, who has not contrived the shell for the defence of the egg with less of skill and foresight than He has composed all the other parts of the egg of the same matter, and produced it under the influence of the same formative faculty" (p. 207).

ENLARGING VISION.

The race has travelled far since Harvey's day. Means and methods of research unknown then are at our disposal now. The range of vision, alike towards the infinitely large and infinitely little, has gone on extending. The lessons of sense have not been lost on the self-conscious inquiring mind which has ever to adjust itself to the new unfoldings of its environment. In every new page of human history, the Harveys—the men of broad mind and attentive vision—still find themselves intelligent units in a universe which is to them a Poem, and the Poet is God. A Harveian of the twentieth century, when he comes to search into the questions of the What, Whence, and Whither of Life, may seem to belong to a different country from the Master, and to speak a foreign tongue. His lexicon has in its columns words coined since Harvey's day, because the Supreme Poet is still at work, and in each new generation is making fresh unveilings before eyes that look to see. As he turns aside to-day to see Life in its earliest epiphany he pictures it, not in the first blood-drop that catches the eye in the incubating "colliquament" of an egg, but in a microscopic speck of jelly-like matter that he calls "protoplasm." This protoplasm he can resolve into its elements in his laboratory, but he cannot build them together again into a thing that is zoic and zoögenic. Carbon, Hydrogen, Nitrogen, Oxygen, Sulphur, and whatever other less constant element may be taken up in the material build of the living thing, were in the planet long before Life laid hold of them for its service, and they are still there when Life has laid them aside. We never see Life dissociated from matter, yet we can see with Bergson (*Evolution Creatrice*, p. 267) that whilst matter is something sinking on a downward slope towards static rest or decay, Life, using matter and contending with it as it were, is ever moving up the slope towards new achievement.

LIFE THE CAUSE, NOT THE CONSEQUENCE, OF ORGANISATION.

Naturalists know that there can be life apart from organised material. "Whatever life is," says John Hunter (*Essays and Observations*, 1861, i. 114, 115), "it certainly does not depend upon structure or organisation." "Organisation is not essential to life." And again, "The living Principle appears to be the same in all animals" ("in essence, not in degree," notes his wise editor, Richard Owen). Huxley tells us (*Introduction to Classification of Animals*, 1869, 10)

that Rhizopoda illustrate "a very well-founded doctrine, and one which was often advocated by John Hunter, that life is the cause, and not the consequence, of organisation; for in these lowest forms of animal life there is absolutely nothing worthy of the name of organisation to be discovered by the microscopist." The Harveian, then, who puts himself under the guidance of the modern representatives of the magisterial minds whom Dante groups round Aristotle—"the master of them that know"—and I like to remember that one-fourth of the names he celebrates belonged to our profession—the Harveian who finds time to attend a little to the teaching of the modern leaders in astronomy, physics, chemistry, geology, biology, learns that before life has taken on or been taken on by matter there is evidence of the existence and activity of a Living One which it would be perversity to ignore. The learner has his place to-day on a planet which is small among the stars and suns that roll through the immensity of space, and which took beginning long after some of them. As in many of them still, he sees that there were dateless periods far anterior to any epiphany of life on earth, when the possibilities of the existence of a living thing was not as yet evolved. They were not times of Chaos, these leisurely revolving epochs. As stage after stage is built up of the theatre on which the great drama of life could be unfolded, let the Harveian, like Harvey himself, but keep all that is within him free to look fairly and to think fearlessly, and he cannot fail to see the directive working out of a purpose by a Being majestic in truth, in wisdom, and in power. If I heard in my drawing-room thrilling notes of music and a voice calling me to—

"Worship the King all-glorious above,
O gratefully sing His power and His love,"

and I went expecting to join my daughter in her song, it would greatly perplex me to see no player, no singer, there. But I could not conceive that the movements of the keyboard went on spontaneously, and that the words sounded themselves without vocal cords in the empty air. I would rather believe that she had found and put on the fabled ring (Rev. Dr. Joseph Cook's *Boston Lectures*) of the King of Lydia of old which made its wearer invisible. Or if at another time the strains had been more mechanical, and I came and saw the pedals of the pianola apparently moving of themselves, I would conclude that she had passed on the Gyges ring to her brother.

INTELLECTUAL CINEMATOGRAPH OF CREATION.

Now the twentieth-century Harveian, who during his medical curriculum has to learn something of the rudiments of various ancillary sciences, does not need to make wide excursions through their various fields till he is made aware that they all lead on to a glowing globe of fiery mist as the earliest conception to be gained of our material planet. Under the guidance of the seers of science he watches the cooling, and consolidation, and contraction and contortion on the surface of the mass amid the play of the æonic inherent forces, till after long ages and through many transformations there is evolved the as yet inorganic Earth with its vicissitudes of land and sea and air and cloud that have made it possible for it to become the habitat of Life. It is easier for him to-day than it was for the last century Harveian to trace back step by step the purposive processes of the Eternal Spirit, of whom, and through whom, and to whom are all things.

TRANSFORMATION OF METALS.

As I passed along one of the paths in the Grange Cemetery the other day a name on a modest tombstone caught my eye and recalled the memory of the gentle pensive face of a man I once saw in my uncle's house about sixty years ago. I was then attending the chemistry class and was being taught the then current views of the immutability of the elements, and as Sir James and his friend had been having a lively discussion on some chemical subject, I asked his assistant who the visitor had been. He said, "Oh, that's a dreamy kind of chap who thinks that all the different elements are just different forms of one and the same thing—lead and silver and gold all coming from some more primitive element. The other fellows laugh at him. But after all," added Dr. Drummond, "for aught I know, he may be right." Dr. Samuel Brown is being vindicated to-day by the chemists who speak of the "Ancestry of radium" ("The Evolution of Matter," by W. C. D. Whetham, F.R.S., in *Darwin and Modern Science*), and who, "on the hypothesis of direct parentage," can give the "pedigree of radio-active change shown by one family of elements"—Uranium, through Radium, &c., on to Lead. The physicist, on his part, recognises that the atom is a "manufactured article," and searching back and back through matter toward the intangible invisible ether, of which he has become positively aware, he comes to something that he likens to a vapour whorl or a knot on a

thread of electricity. Surely to the Harveian now the veil between the seen and the unseen is becoming translucent. The rents in the septum between the material and immaterial are becoming so many and so wide as to make it natural to expect that "spirit with spirit can meet."

JOHN GOODSIR'S "THOUGHT OF CREATION."

All this makes it easier for John Goodsir's students to appreciate the lessons he taught them when, *e.g.*, he said: "We cannot think of a thing but as an existence. We cannot think of a thing except under the condition of Time, *i.e.* we are under the necessity of considering it only as a new form of what existed before it. Therefore we cannot think of it as absolutely commencing *per se*. We are able to conceive the creation of a world—this, indeed, as easily as the creation of an atom. But what is our thought of creation? It is not a thought of the mere springing of nothing into something. On the contrary, creation is conceived, and is by us conceivable, only as the Evolution of existence from possibility into actuality by the fiat of the Deity."

FIRST EPIPHANY OF LIFE.

If so far, the Harveian has been reading the great poem of the Universe, he has learned how the theatre was built on which preparation was made for the development of activities more wonderful than any that could be weighed in the balances of the physicist or subjected to the analysis of the chemist. The wonderfulness of these activities and of this new phenomenon among our planetary phenomena lies in this, that whereas heretofore the Unseen has thrown out from Himself the uninhabitable globe of matter and guided it in its evolution to become a habitable globe, He now in the fulness of time begins to take matter into closer relation with Himself by imparting to it something of His livingness. As in His other ways, in this also He comes without observation. Had there been a Harveian present when life first entered on the scene he might have found it difficult to see how the 2000 to 30,000 (2703 of Zinoffsky; 30,000 of Bate-Hardy; cf. *World of Life*, pp. 293, 355) atoms in a proteid molecule, which life was to clothe itself with and then lay aside for the chemist's analysis, were fashioned into the protoplasmic vesture. What he could see was something that was not an element among the pre-

existing elements, nor a force among the already operative forces. It could dwell in and be indwelt by the archaic elements; it could modulate and be moulded by the æonic forces; it could only be known by its influence on the elements it was laying hold of and being laid hold by for a time on its onward way. No rock could add to its bulk, no wave could move except in the direction it was driven. The object that has life, the *zōon*, was seen to grow by taking to itself and transforming from within what material it required; it could contend with the gravitation that kept the stars in their places. "We know to-day," said Virchow in 1849, "whence the wind comes and whither it goes, but we know not whence the general stream of life comes and whither it goes. The wind rises and goes to rest: a new wind springs up and passes by, but it is always the same air which streams now this way and now that. It is not so with Life. Nowhere do we see spontaneity, nowhere life originating in local conditions. A long chain of movement-epiphanies passes before our senses without interruption, without real rest, but it is not the same substance through which this endless movement runs. One part after another dies off and passes out of the current, and new particles from the air, the water, the soil are drawn into the great whirl. From the moment when, at the time of the anthropogenous revolution of the earth the general movement took on in part the impulse of life, we have a wave without an ending." This is from that essay in which Virchow (*Gesammelte Abhandlungen*, p. 39), advancing on Harvey's position, formulated the doctrine *omnis cellula e cellula*. If Weismann carry the modern still further and bid him see the endless wave of life passed on from germ plasm to germ plasm within the cell or its nucleus, it still remains easiest to watch life declaring itself as it makes its way onward and upward from cell to cell until it reaches the far-off height of its evolutionary display in the creature *Homo Sapiens*, who can think of it, and speak of it, and apprehend what yet he may not fully comprehend.

ELUSIVENESS OF LIFE.

At any stage the observer can only trace the activities of life. If through any experiment he tries to lay hold of it, before he knows he has killed it. It is like Socrates when, the hour for his hemlock draught being at hand, Crito asked him, "How shall we bury you?" and Socrates answered, "As you please; only you

must catch me first, and not let me escape you. . . You must be of good cheer and say that you are burying my body; and you must bury it as you please, and as you think right" (Phædo, lxiv.). Or it is like that brittle star-fish of which Edward Forbes told his students, which was furnished with an eye at the end of each ray. He and others were eager to catch one entire in their dredging operations. They thought they were at last succeeding in their quest when they saw among the contents that came to the surface of the water a lovely *Luidia*. But the moment a ray was touched it detached itself from the rest and slid back into the sea. As they held the net hesitating how to secure the creature, they saw limb after limb break off and fall away, till there was only one arm left attached to the body, which now slipped through the meshes, and as it was sinking out of sight the eye at the end of the ray closed with something, Forbes said, "like a wink of derision." Or, again, let me remind you that Harvey knew his Virgil, and quotes with satisfaction the lesson that Anchises taught the pious son who came to visit him among the shades (282)—

"Tis innate soul sustains; and mind infused
Through every part, that actuates the mass."

I recall this here to suggest that the Harveian seeking to grasp the secret of life is like Æneas when he wished to embrace his ghostly father. "Thrice he tried to throw his arms around his neck and thrice the figure escaped the vainly grasping hands, as if it had been soft air and very like a fleeting dream."

CHARACTERISTICS OF LIFE.

If ever a member of our fraternity is to see anything of the meaning of the primordial living object, he must carry with him some clear consciousness of that in himself towards which life was coming through the long succession of the zoic ages of the planet ere it gathered him up in its onward sweep. He has to put himself into it and bethink him what inheritance it will begin to pass on to him. Trying to mark it off from non-living things by its characteristics (for which see "Biology" in Hastings's *Dictionary of Ethics*) he will note among others these two qualities pre-eminent among those that differentiate it from all inorganic things—(1) it has the power to grow; (2) it has the power to multiply. In its constant conflict with its material environment it lays hold of what it needs to sustain its existence and promote its working

power. Let it go on to assimilate beyond these necessities and there is before it the danger of death or degeneration. A nobler fate will befall it if, instead of playing the egoist, it takes the altruistic alternative of surrendering its own individuality and giving place to two successors. For there in its earliest epiphany Life is seen bearing a burden of service and showing a trace of the red streak of sacrifice that accompanies it along all its way. It is so vain to explain what is to be seen of life on the principles of mechanism and geometry that Professor Haeckel, the very Coryphaeus of materialism, puts immaterial soul in the first microscopic progenitor of all that lives, from which man himself has sprung and to which his embryogeny bears witness, in accordance with the Haeckelian law that each individual recapitulates the story of his genealogy during his evolution from ovum to infant—"ovum, worm, foetus," as Harvey has it. The zoön, with its sphere of operation among material things, is subject to all the laws that reign in the realms of matter. By virtue of that which is not material in it, it brings into view laws that reign in the realms of life. One of the most impressive of these marks the diversity that arises from the unity of life. The zoologist, who does not let the mind rest at any backward-tracing point in the evolutionary programme of creation till he arrives at his and our primordial protoplasmic speck of an ancestor, comes in sight of one endowed with a power that as it multiplies produces a divergent progeny.

DIVERGENT LINES OF LIFE.

Along one line the cells clothe themselves with a covering of cellulose that stiffens them. Some degree of the inertness of the material in their origin asserts itself in their progress. They become stationary; they grow by assimilation of matter from the soil into which they have fallen, and of the air and light that plays upon them where they rest and root themselves. These are the progenitors of the vast and varied products of the vegetable world. They, in a measure, come to their own at an earlier date in the cosmic story; at least we have their relics in the strata which have failed to hold the traces of the earliest forms of animal life. For these other offshoots from the common progenitor have retained their freedom. Their loose outer covering allows them to move about in every direction in quest of their requirements. At times they find what they want in some fragment that a plant has no longer use for, but that has become more easily assimilable through

the change in its elements the plant life had brought about. It may be that the cells that are moving towards animality, even at that early stage, may take into their substance smaller cells still instinct with vegetable life, as will be seen to be the rule between their respective descendants when the laws of life are broadening their scope. Yet the memory, shall we call it? in the vegetable progeny, of the possibility of development towards the animal line of life is never so utterly lost but that some among them live a motile life, and others, not content with drawing sustenance from the inorganic world, become parasitic on other plants, or even have been led to the assimilation of animal nutriment. Likewise along the animal line we come on some who have surrendered the motility that is the common characteristic of their kingdom to become stationary, and perhaps show that their chief function in the scheme of life is the vegetable one of serving as aliment for others that have passed them in the race.

THE PROCESSION OF LIFE.

To get an impression of the grandeur of the procession of Life on its way through paleozoic, mesozoic and kainozoic ages and their subdivisions, one has to put oneself under the guidance of a great leader in science like Alfred Russell Wallace in his *World of Life*, or of the hereditarily mystic member of our profession, Dr. Greville Macdonald, who applies his scientific knowledge to an inspiring study of *The Child's Inheritance*. It were too long, and it is needless in a Harveian company, to attempt even a summary of the bioeopic panorama, but let us note some things about Life as it unfolds itself to our vision. It retains something of identity, of oneness, amid endless variety of expression. Ungainly of form, or invested with beauty, it remains ever distinct from all its environment. It holds true to its own characteristics; it keeps up a solidarity through all its domains.

INSTINCT AND INTELLIGENCE.

As it takes a new direction it seems to carry with it the possibility that it might have taken another course. Along one line of progress the psychic in it will emerge in forms where instinct rules the activities. Even then, however, there are manifestations of the intelligence that was involved equally with instinct in the common ancestor, whence came also the line along which intelligence grew from more to more. And here, again, what instinct contributes to

the zoic development was not so completely laid aside but that its influence can be clearly discerned where intelligence has reached its highest. Indeed intelligence cannot come to itself without the adjutancy of instinct.

PROGRESS IN A SPIRAL.

Further, on the cover of Goodsir's *Contributions* he used to print a spiral. His genius saw, and made his pupils see, a law of spirality pervading all organic growth, whether in the animal or vegetable world. According to this the procession of life moves onward in a course that cannot be represented either as a straight line or as a circle that returns upon itself. The spiral may end in a point that represents the last product of an order or a genus, and if we think of that spiral throwing off buds of a new species from its concavity, the likelihood is that all this inner progeny will share the fate of the progenitor and be found among the forms that creative evolution has laid aside among the testimonial treasures of the rocks. The line of larger and onward development is to be sought among the outgrowths from the spiral's convexity, with its wide outlook and unconfined possibilities. The "go" of life, the *elan vital* as Bergson has it, carries it up and up this spiral staircase, and us with it, until we find ourselves on the broad field on which we are called to play our human part.

THE UNIVERSE A HARMONY.

Up till this stage has been reached there has been no note of discord through all the ages and the spaces. If in our planet there were times of formlessness and emptiness, yet the sounds that issue from the deep are all harmonious. If there seem to be broken lines or absent pages in the poem of the universe these also will be all filled in when the race that is still at school has better learned to spell it out and read it. It might be expected that the harmony would be most complete when among the other forms of life this new epiphany arose, for which it seemed as if all the rest had been a preparation. All the physical conditions now present in this planet, and all the varieties of life, animal and vegetable alike, had come to such a stage in their evolution that they could be subservient to the uses of a creature that should dominate the rest. Without looking at the manifold provisions of the vegetable world, when

we consider how many animals were awaiting his arrival ready prepared for his domesticating powers, like the foxy five-toed eohippus of the early tertiaries that grew through the miolhippus and other stages of evolution on to the solidungulate that could go with man in his trudge to the South Pole or gallop him on the sands of Arabia, it makes us, to compare great things with small, look on evolution as an expectant mother making long provision for the advent of her unborn babe. Yet small as is this babe, the last product of the long evolutionary processes, he is greater than all preceding products—yes, and greater than all the processes that have led up to him, for Life, in the epiphany that arises in this new creature, puts on qualities hitherto unexpressed.

A NEW EPIPHANY OF LIFE.

He has come, if you like, without a break from the earliest monad, though in following his track you may find as long intervals as lengths of link in the chain. He may have come by the way of germ plasm transmitting to germ plasm the power to grow around itself the varying form of body that differentiates kind from kind, and that serves in each as guardian for the life-propagating cells. This somatic "exerescence," as it has been called, has gradually developed in it, through nerve and ganglion and brain, the structures that are the seat of sense and instinct and intelligence. Until now it has fulfilled its function faultlessly, irresponsibly obedient to internal impulse and outward influence. In man the guardian soma attains the dignity of a trustee. "That peculiar principle," says John Goodsir (*Anatomical Memoirs*, i. 316), "in the constitution of man, which acts independently of his instincts, and in virtue of which he is conscious of self, capable of apprehending the objects around him as external to self, enabled to exert his corporeal and physical powers in the accumulation and co-ordination of ideas and their origin; but, above all, capable of determining between right and wrong; of recognising his own immortality; and his dependence, as well as the dependence of all around him, on his and their Divine Creator, is an intelligence altogether different in kind from the instinctively co-ordinated intelligence of the brute."

Man is conscious of himself; he can recognise and name his fellow-creatures, whom he sees without self-consciousness obedient

to the laws and rules of their regulating instinct or their modicum of intelligence. He is conscious of free will, and may follow the dictates of his self-conscious regulating principle or may act contrary to them. He can not only know and think and utter his thought, he can manufacture. So that Bergson suggests he should be labelled *Homo faber* rather than *Homo sapiens*. He can know, and knows that knowledge is not an end. He can think, and that with the view to make knowledge and thought the guides to action, as we are learning from the pragmatism that has come to take an effective place among the thoughtfulnesses of philosophy. For the Pragmatist recognises that thought is meant to be exercised not as an end in itself, but to have an outcome in activity serviceable to the thinker or his neighbour.

THE UNIVERSAL HARMONY DISTURBED.

The sorrow of the world comes in just here, that the creature into whom the Eternal Spirit had put that something of His spirituality that distinguishes him from other zoa—as He had put into the primal organism that something of His livingness that differentiates it from inert matter—the creature who might have been expected to give voice to all the harmonies strikes a note of discord that vibrates through the ages. Consciously free to set his will either in subjection or in opposition to the will of the Supreme, he chooses to play the rebel part. It is an honest confession that comes in Ovid's wail from the heart of humanity—"I see the better and approve it. I follow the worse."

LIFE MISSING ITS AIM.

This is not the occasion to trace the generational procession downward from primitive innocence and harmony, in the conflict in man between the better and the worse—in individuals, in families, in races. Throughout it can be seen that the Creator never forsakes (as in our anthropomorphic phrase we put it) the work of His own hands. Ever from time to time, on the downward slope, from monotheism towards polytheism and pantheism and animism and the various cults and cultures with which men content their conscience, one and another has been found who could keep his spirit freer than his fellows to welcome and to obey the intuitions that come to all from the Father of our spirits. These are they who have expended their share of Life to bear burdens and make sacrifices for the good of their neigh-

hours, because they have set themselves to know and to do the will of the Supreme. Like good physicians, they do not ignore the unhealthy condition of the race. They recognise that "the whole head is sick, and the whole heart faint." There is something wrong both with intellect and intuition (emotion). The prophet whose diagnosis I have quoted is even more precise, and says that he and his people are all the subjects of a malady accounted hereditary, contagious and incurable, and that was benumbing, disfiguring, destructive and deadly. "I am a leper," Isaiah said, when he saw the pre-incarnation glory of Jesus (John, xii. 41); "Woe is me! for I am a leper, and I dwell among a leprous people." Those who knew the malady knew where to turn for the cure. This sin, that has come by permission of the Creator but is no part of His handiwork, and that may be set down, like the mathematician's unknown x , as a privative—God's prophets saw it giving darkness for light, falsehood for truth, hate for love, and death for life; and they looked to Him for a new creation in which, at last, it may be nothing but a memory.

THE LATEST AND GREATEST OF LIFE'S EPIPHANIES.

They did not look in vain. That sin might be put away, Life had to put on a new Epiphany. The Living One had to come into living union with the race. And He came. He, apart from whom nothing came into existence that exists, became flesh, and pitched His tent beside ours. He did not abhor the Virgin's womb. Ten lunar months was the term, as Harvey in his reverent fashion states it, "which we believe was kept in the womb of His mother by our Saviour Christ, of men the most perfect." The first question we hear Him ask, and He is asking it of us to-day, is, "Wist ye not that I must be about my Father's business?" That business was not to make men religious. Religion had been built into the constitution of primeval man made after the image of God. Christ came that we might have Life, and might have it more abundantly. Let a Harveian put himself in the company of the clear-sighted young fisherman who followed Jesus when his teacher said, "Behold the Lamb of God which taketh away the sin of the world;" let him hearken to John Ben-Zebedee saying to us moderns what he wrote to the first-century disciples, "The Life was manifested, and we have seen it, and bear witness, and shew unto you that Eternal Life which was with the Father, and was manifested unto us," and he will find himself entering also into fellowship with the Father and with His Son, Jesus

Christ. He will find himself brought into harmony with the Will that wills our peace and makes all things work in harmony for our good. He will learn something of "the power of an endless life"—the dynamic of an akatalytic (indissoluble) life. If he make experiment for himself, as becomes a man of science, he will come to agree with a Scotsman of Johannine spirit who has said: "The Theanthropos is the centre of all things—the centre of the Trinity, the central figure in history, the centre towards which the heart of man gravitates, and in the heart of man its centre" (Knight's *Colloquia Peripatetica* of Professor John Duncan, 110.)

TRUTH OR LIE?

The story of that Son of Man from whose arrival on the planet we date our centuries, before and after, may be dealt with after another fashion. Some exercise their intellect in emptying Him and His history of the Life that to others is the light of life. Let their spokesman be a clerical novelist (Gustav Frenssen, *Hilligenlei*, 585). "Human He was. Proof enough of that! First; He said so Himself. Second; in His thinking He was a child of His time. Third; He was a peculiar epiphany of character (eine besondere Charactererscheinung). Fourth; He had a development. Fifth; His nature was not free from evil. Sixth; He went wrong, especially in His beautiful warm Child-belief; He did not come back, and the Kingdom of God also did not come. . . . He was a human being, nothing more." Any man is free to talk thus, if it pleases him. He may go further and say, "There was no Jesus Christ at all; the whole old story of The Good News is nothing but a myth." It is easy to deny, very easy and very cheap—for the present. But they who use their time on earth to empty Christ of His Godhood, and who will not come to Him for a part in the akatalytic life He brought, and laid down and took up again that He might share it with the race as the Head of the new creation—these brave collectors of negations, to what shall I liken them? They look to me like mariners setting out to sail the "unplumbed, salt, estranging sea" in a vessel charged as to her tanks not with fresh water but with wine that "is a mocker," and plentifully provisioned—with empty egg-shells.

HARVEY'S CREED.

Dr. William Harvey did not take ship with these. He was the eldest son in a family that was reverent enough to write on the

tombstone of the wife and mother that she was "A Godly harmless woman. . . Beloved of her neighbours, Elected of God." There are many sentences such as I have quoted scattered throughout his writings referring to "the Omnipotent Creator whom it has pleased out of the smallest beginnings to exhibit some of His greatest works" (320). And he made his will "In the name of the Almighty and Eternal God," and says, "Imprimis I doe most humbly render my soule to Him that gave it and to my blessed Lord and Saviour Christ Jesus." Such an exordium may have been customary in the wills of his time. I do not know. Still, it was a man who thought out things sanely and purposefully who drew up that will, when the passing of his seventy-fourth year and recurring attacks of gout gave warning that his span of life was shortening. When his last year was more than half gone, and he felt that it was time more definitely to reef his sail and take in his oars, he read the will over again, and with his own hand added a codicil making, among other changes, kindly additional provision for his servant Alice Garth, "for her diligence about me in my sickness and service." "Sunday December 28 1656" is the date of this last will. On the morning of that First Sunday after Christmas he may have joined, as he had often done before, with other members of his Anglican Communion in repeating the creed that embodies the faith of the world-wide Church, saying, "I believe in God the Father Almighty, Maker of Heaven and earth," through all its clauses on to "the resurrection of the body, and the Life everlasting."

On these last four words of the Apostles' Creed young Percy C. Ainsworth, before he passed into the Unseen nearly two years ago, left us these lines:—

"It is not something yet to be revealed—
The Everlasting Life—'tis here and now :
Passing unseen because our eyes are sealed
With blindness for the pride upon our brow.

And if we feel it not amid our strife,
In all our toiling and in all our pain—
This rhythmic pulsing of immortal life—
Then do we work and suffer here in vain."

Our Harvey did not work and suffer here in vain.
Nor need we—my FELLOW-HARVEIANS.

ADENOMA VAGINÆ DIFFUSUM (ADENOMATOSIS VAGINÆ), WITH A CRITICAL DISCUSSION OF PRESENT VIEWS OF VAGINAL AND HYMENEAL DEVELOPMENT.

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THIS exceedingly rare condition has been recently described for the first time by Bowley and Bryden Glendinning.¹ Bowley and Glendinning describe the clinical features as follows²:—A red granular honeycombed appearance of the vaginal walls, small cysts, and a continuous secretion of a mucous fluid like white of egg.

Pieces of the vaginal lining, when removed and submitted to microscopical examination, gave the following condition:—Epithelium poorly stratified, reduced to a single layer at many places; fibro-muscular stroma, with the muscular element predominant but ill-formed; tissue permeated with numerous gland-spaces lined by a single layer of columnar epithelium, which was traced in continuity with the superficial layer; no elastic tissue immediately under the epithelium, but its presence round the vessels.

In Dr. Haultain's case, malignant disease developed later.

I now take up in explanation of this condition the question of the development of the vaginal tract in the human female, and also in marsupials. This involves the consideration both of vaginal development and also of the nature of the hymen. The first has special bearings on diffuse adenoma of the vagina, but I purpose at the end of the paper also taking up critically the development of the hymen.

If we look at a transverse section of the genital cord³ in a human embryo about the sixth-seventh week we see in it three lumina; the two outer are the Wolffian ducts, separate, the mesial one the two Müllerian ducts coalesced. It is important to notice

¹ Bowley and Glendinning, "Adenomatosis Vaginæ, a Hitherto Undescribed Condition," *Proc. Roy. Soc. Med.*, iv. ; *Obstet. and Gynec.*, I. Trans. p. 18.

² A case has also been recorded by Dr. Haultain, in whose practice it occurred some time ago.

³ The genital cord is practically the part where the ducts of Müller, Wolffian ducts, and urinogenital sinus are imbedded in connective tissue, and not free at any part of their periphery.

that at this early stage—sixth-seventh week—the septum between the Müllerian ducts has disappeared. The Müllerian duct is lined at this time with a low columnar epithelium. At a certain level of the urinogenital sinus corresponding to a point in the adult vagina an inch or so above the hymen there is a distinct projection on the posterior wall of the duct—the eminence of Müller. Here the Müllerian ducts end blindly. Below the eminence of Müller the Wolffian ducts open one on each side (Fig. 1). The urinogenital sinus is relatively long at this period, and indeed has been described erroneously as the future vagina. At this stage, then, the Müllerian duct, which will form part of the future vagina, has a single lumen, is lined with columnar epithelium, has no lower aperture, and no hymen is present. In earlier sections the ducts are double.

The next distinct stage of development known to me is at the fourteenth week, and this is an important period, as it is at this period of fetal development that the hymen develops. I have examined two specimens at this time, and, so far as I know, no other similar specimens have been described, even by observers who have strong views opposed to mine on the nature of the development of the hymen. Specimens at this period are best cut in the form of a central mesial slab in sagittal central section, as the paraffin blocks are somewhat large, and this direction gives a useful view of the whole tract.

In such a section one can see from above down—(1) The uterus with a lumen and beginning formation of glands; (2) the lower end of the cervical canal blocked with epithelium; (3) the vagina solid with cells, and with a line of clear space between them and the connective-tissue wall of the duct; (4) at the lower end, a remarkable condition, viz. a development of two bulbs of epithelium with cells exactly like the squamous epithelium of the adult vagina, and into one of these I traced the Wolffian duct. From these bulbs—the Wolffian bulbs—the squamous epithelium spreads up into the Müllerian duct, blocks it, absorbs its epithelium, maps out the future fornices, solid also, and passes a short distance into the cervical canal. Outside the bulbs, and higher up, the epithelial streams from each bulb communicate before entering the Müllerian ducts, and one can still see the Wolffian duct lying by the side of the vagina as would be expected (Figs. 2, 3, 4, 5).

Thus, at or about the fourteenth week of foetal life two lateral bulbs develop at the lower ends of the Wolffian ducts at a level a little below the eminence of Müller, where these open into the

PLATE X.



FIG. 1.—T. S. genital cord, 6-7 weeks' fetus; in front, urinogenital sinus; between sinus and pouch of Douglas, Mullerian and Wolffian ducts; behind pouch of Douglas, rectum.

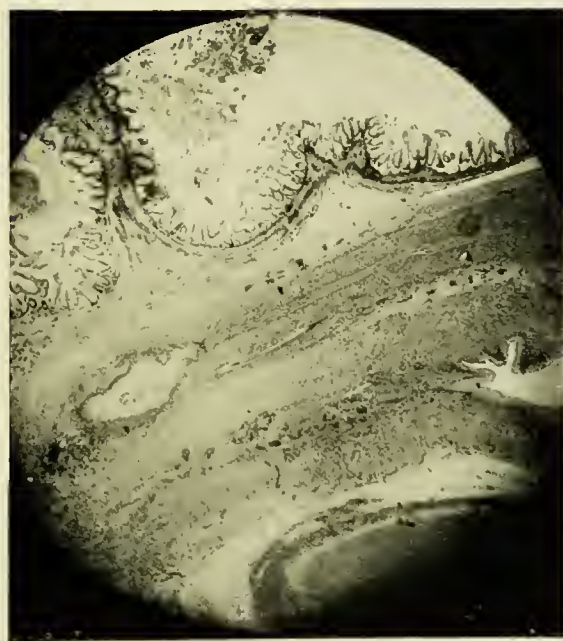


FIG. 2.—Shows sagittal mesial section of 6-7 weeks' fetus; at left side coalesced Wolffian bulbs passing into Mullerian solid duct; below, Wolffian duct.

PLATE XI.

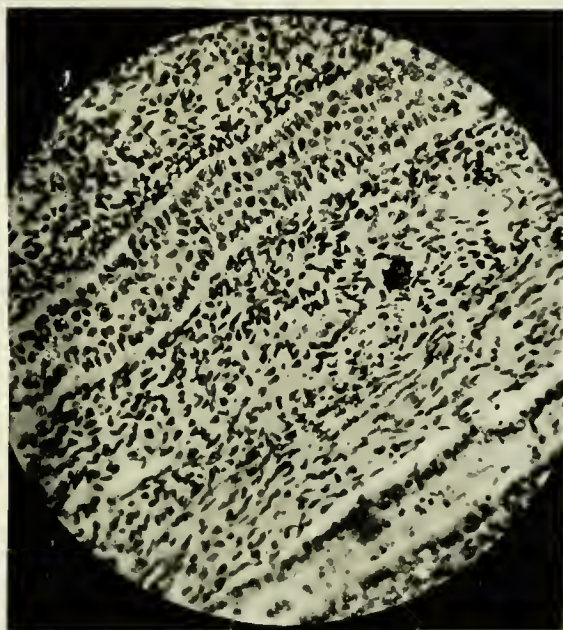


FIG. 3.—Shows solid Mullerian duct above and Wolffian duct below (14th week).

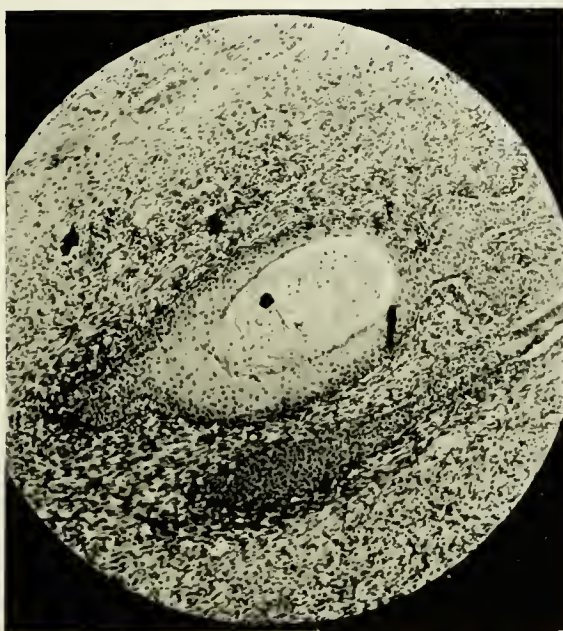


FIG. 1.—Shows large Wolffian bulb above, with epithelium passing into Müllerian duct ; below is second Wolffian bulb with Wolffian duct continuous (14th week).

PLATE XII.

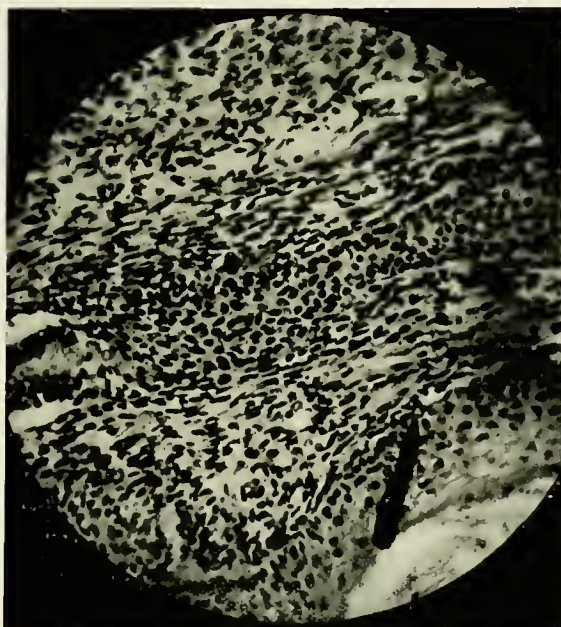


FIG. 5.—Shows Wolffian duct ending in small bulb and part of larger bulb in front at lower right corner.

urinogenital sinus, and thus a little below the site where the Müllerian duct forming part of the vagina ends blindly. These bulbs proliferate in two united columns, pass up into the Müllerian vagina, absorbing its epithelium, and then this solid ingrowth breaks down centrally and gives once more a vaginal lumen. This, however, is now of a stratified squamous nature, able to stand the friction of labour. It is analogous to skin in its structure, and differs from it in not possessing hair or glands.¹

We get a very striking illustration of this method of development of the vaginal tract if we consider the structure, naked-eye and microscopic, of the vagina in marsupials.

The Vaginal Tract in Marsupials.—The vaginal tract in the marsupials is very remarkable, as it is made up of three canals known as the lateral canals and the central canal. The two lateral canals communicate with the upper part of the central one, and open into the urinogenital sinus below. The central canal is a closed pouch usually, but in some, for instance in Bennett's kangaroo, the central pouch communicates directly with the urinogenital sinus. When it does not, it is said that in parturition the embryo passes from the central pouch into the urinogenital sinus, thus breaking down the separating tissue. This is a very extraordinary fact, and it may be that the other view, viz. that the foetus passes down the lateral canals, is correct.

In 1907 I examined microscopically the entire genital tract (one lateral half) of the rat kangaroo, and found a very remarkable condition present.

The lateral canals are lined with a multiple-layered epithelium like that of the adult human vagina, while the central portion has a glandular epithelium. There is thus preserved in the central canal the temporary condition of the Müllerian ducts in the human embryo, and in the lateral canals, epithelium the same as the permanent epithelium which removes and displaces the Müllerian epithelium in the human embryo. The lateral canals are therefore Wolffian ducts in whole or in part (v. d. Broek), the central canal the Müllerian ducts combined, or cervix according to v. d. Broek.

In considering this point again, in view of v. d. Broek's criticism that the whole lateral canals are not a vaginal element, it occurred to me to look over Owen's specimens again. In one of them there is present what looks like an os externum, at or about

¹ Von Preusschen long ago described occasional glands in the adult vagina a fact explained by its development given above.

the lower third of the lateral canal. If this be right, then below the os externum is vaginal; above it, up to the top of the central point, uterine. As it is lined with squamous epithelium in many layers, it corresponds to the part of cervical canal in the human fœtus temporarily lined with squamous cells like the vagina.

Diffuse adenoma of the vagina in the human female is thus a persistence of a fetal condition owing to the epithelium of the Mullerian ducts remaining permanent, probably from its not having been absorbed and replaced completely by the ectodermic cells of the Wolffian bulbs.

I wish now to discuss the various views of the nature and development of the hymen.

Within the past few years the question of the development of the vagina and hymen has been a good deal investigated, but observers are still at variance in their opinions, and as I am mainly responsible for one of these, viz. that the vagina is Müllerian in its upper two-thirds and urinogenital sinus in its lowest third, and that the hymen originates from the lower ends of the Wolffian ducts and is a development in the urinogenital sinus, I purpose reopening the subject and considering critically its main points.

In the adult virgin female the relations and naked-eye anatomy of the hymen can be observed in an operative case when the patient is under chloroform and in the lithotomy posture. If the labia minora are drawn not too far apart, it will be found to be a double pouting sagittal mesial ridge with the edges of the slit-like opening in apposition (Cullingworth), the upper coalesced ends often overlapping the urethral orifice. The alleged various forms of normal hymen, where the aperture is described as oval, crescentic round, and so on, are due to lateral traction on the edges of the hymen, causing disturbance in their normal apposition. Even when the hymen has a double slit the above applies.

On naked-eye examination of the hymen in anatomical virgin specimens, one can see on its inner aspect rugæ continuous with those of the vagina, as Budin pointed out. Its covering is more analogous to skin, a fact often rightly emphasised as regards the vagina. The microscopical structure of the hymen has been well described by Gellhorn among others. It is covered with a many-layered epithelium on papillæ of connective tissue, with elastic and sometimes unstriped muscle in its substance; special nerve endings have been observed. In the hymen in some atresic cases it has been noted that the inner surface is covered with single-layered epithelium, the outer with multiple-layered epithelium.

Nagel, in a sagittal section of a 4 cm. foetus, describes the eminence of Müller as made up of special protoplasmic cells, and considers the cells at the level of that part of the Müllerian ducts forming the future vagina to be of a different nature from those at a higher level. Any change in the epithelium afterwards he considers as a local development and not an invasion from any other source.

It is very generally held that the hymen is the thinned-out lower end of the vaginal walls. Budin, who stated this view very clearly and fairly, studied it from the point of view of naked-eye anatomy, and pointed out that the vaginal rugæ could be traced on the inner surface of the hymen. In this he is quite correct, but in a conversation that I had with him on the subject he stated that this was not conclusive evidence that the hymen had not an origin from the Wolffian ducts.

Pozzi and others have associated the hymen with the vulva, and Matthews Duncan drew attention to the fact that in ordinary atresia hymenealis leading to the retention of menstrual blood the edge of the hymen was present. This I have verified in some cases and found that the hymeneal edge fringed the occluding membrane.

The view that the hymen is vulvar¹ in its nature is quite untenable. The hymen lies, in the adult virgin, in the lower part of the former urinogenital sinus. It is separated from the labia minora, has the vestibule above it and the vaginal aspect of the fossa navicularis between it and the fourchette. Those who hold the view argue by imperfect exclusion, and conclude that if the hymen is not Müllerian it must belong to the external genitals, thus leaving the urinogenital sinus quite out of consideration.

An important contribution to the development of the vagina was made by Tourneux and Legay, and by Nagel, and confirmed by myself and others, when it was pointed out that at one stage of its development the Müllerian lumen became blocked by epithelial cells and was therefore solid for a time.

Klein and Nagel state that at about the fourth and a half month the lower end of the vagina is thus blocked by a mass of epithelial cells, and Klein considered that it was by this breaking down and by an involution from below that the hymeneal aperture was made.

According to Nagel, "the Müllerian ducts are originally composed of large protoplasmic cells of an epithelial character. Around

¹ This view does not include the urinogenital sinus in the vulva.

this mass of cells, which gradually becomes a tube, the mesodermal formative cells are grouped in a circular arrangement, thus forming the first Anlage of the connective tissue and muscular layer of the Müllerian ducts; in other words, the connective tissue appears after the ducts are established, and grows in proportion to and together with the downward growth of the ducts. Thus when the ends of the ducts protrude into the sinus in the form of an epithelial protuberance, their connective tissue comes down with them, grows into the terminal conus, and forms the inner or central layer of the protuberance."

If this be the true mode of origin, "the hymen" (Gellhorn urges) "is a product of the Müllerian ducts exclusively. The epithelium of the sinus urinogenitalis does not play any active part but only covers the outer layers of the epithelium of the Müllerian ducts in the form of a very thin cuticle. Thus it is readily understood why the epithelium of the vulva can be dissected from the hymen as recorded above in connection with the theories of Pozzi and Schaffer" (Gellhorn, *op. cit.* p. 495). Nagel objects to my view that the Wolffian ducts I described may be Bartholinian or a low implanted ureter. The Bartholinian duct, however, has not developed at this period, but does so about the fourth and a half month, and its axis is different, seeing that it runs transversely in to end on the outer aspect of the hymen. A low implanted ureter is exceedingly rare in the adult, and only a few cases have been recorded. I have described such, and shown that the so-called implantation of the ureter is due to a persistent communication of Wolffian duct and ureter; and when the normal development of the ureter and part of the kidney is considered, viz. that it is due to a budding upwards from the Wolffian duct to meet the part developed above from mesoblast, the cause of the anomaly is at once evident.

J. C. Webster of Chicago, in a probationary essay on the "Early Wolffian and Müllerian Ducts" for the Fellowship of the American Gynecological Society, opposes my views and agrees with those of Nagel. The most noteworthy feature of Webster's paper is that he describes no specimens bearing on the development of the hymen. His paper is thus a purely literary one and not of scientific importance. He is not consistent in his criticism, as at page 457 he states—"After the careful researches of Nagel and Hart regarding the origin of the hymen, which I have recently corroborated . . ."—but from the fact that he describes or figures no specimens and had previously disagreed with me, the position he there takes up is a puzzling one.

Gellhorn in his paper urges against my view that "systematic researches of other investigators result in an altogether different conception of the course of the Wolffian ducts. Until recently the majority of observers believed that the Wolffian ducts terminated at or near the cervix uteri in the upper part of the vagina. This view can no longer be held. Beigel, Dohrn, v. Ackeren and others first described *rests* of the Wolffian ducts along the entire length of the vagina, and Klein, in 1897, demonstrated in serial sections the course of the Wolffian ducts within the hymen. It must be noted that v. Ackeren, Klein, and Groschuff, Seitz, Hengge, the last three working with Klein, found the Wolffian ducts within the hymen" (Gellhorn, *op. cit.* pp. 428, 429). These facts, however, are not only not against my view but are directly confirmatory of it. Had the Wolffian ducts normally ended above the level of the hymen that might have been fatal to it. What Gellhorn finds in the quotation given against my view I fail entirely to see; in fact it is totally irrelevant, and I see no point in the quotation hostile to my view at all.

Kempe has shown that in the white rat the hymen develops from a bridge of tissue below the ends of the Müllerian ducts (see Quain's *Embryology*, T. H. Bryce).

Dr. Wood Jones, in a valuable paper, has been the first observer to confirm the existence of the double bulbs I have described, and he considers them to be derived from the Müllerian ducts, but the details are not given and there is thus no opportunity of discussing his views. He believes the hymen to be "the tissue these bulbs do not penetrate." He also confirms my statement as to the urethra becoming occluded by the bulbs and re-tunnelled, a process analogous to what happens at the vaginal orifice. Indeed some observers have described what they term a urethral hymen, which is probably due to this urethral perforation.

One difficulty in accepting Dr. Wood Jones's view is that even at the sixth week the Müllerian duct in the genital cord has a lumen and is single. Dr. Jones's view, apart from other points, would require the Müllerian ducts to re-acquire a double lumen.

The view that the hymen is Müllerian has at first sight much to recommend it, but it fails to account for several facts. In Nagel's account he figures, as I have already noted, in a 4 cm. foetus the urinogenital sinus with the Müllerian eminence made up of well-marked protoplasmic cells, the Anlage of the hymen and vagina, and considers the cells higher up where the uterus and tubes form to be different. The ultimate vaginal lining he con-

siders to be due to a local proliferation, and he figures this as blocking the vagina in a three months' foetus. Those who accept Nagel's view are omitting the consideration of the all-important stage of the double bulbs I was the first to note. All other observers who figure the epithelium blocking the vagina figure it as a single and local epithelial plug. Of course it is a very evident deduction from their facts that this proliferation and distension open up the lower end of the vagina and form the hymen. These two far apart stages of Nagel from a 4 cm. foetus to one at the third and a half month are not the only ones, and to criticise my view on them alone must lead to an erroneous conclusion. Gellhorn, indeed, takes this one stage of Nagel's in the 4 cm. embryo, and writes as follows:—"From this eminence the hymen is formed. The fine details may to my mind be conceived as follows:—When the united Müllerian ducts reach the sinus urinogenitalis they push the thin layer of epithelium lining the sinus forward, and by so doing they make this epithelium even thinner than before. This condition is clearly seen in Nagel's picture. In this stage the lower ends of the Müllerian ducts represent a somewhat cone-shaped solid epithelial cord. The formation of a lumen proceeds from above downwards, and this canalisation corresponds with the course of the ducts themselves, with its concavity anterior. Therefore the point where the lumen of the duct breaks through the solid end is as a rule nearer the upper border of the conus and so is responsible for the production of the semilunar form of the hymen, which is by far the most common. The concave course of the Müllerian ducts is due to the curved abdomen of the embryo. The extremity of the conus (Müllerian eminence), with a more or less eccentric lumen projecting into the sinus, consists at first only of the epithelium, covered on the outer surface with a very thin layer of sinus epithelium. Only secondarily is this mass of epithelium invaded by connective tissue" (Gellhorn, pp. 434, 435).

Gellhorn admits that this account of his as to the origin is almost entirely hypothetical, and it is indeed remarkable as a piece of induction. He describes the development as occurring in the stage of the 4 cm. foetus of Nagel, and does not figure any subsequent stage or indeed describe any such until the fourth month of Nagel's specimens. The hymen is not formed at this early stage but at a much later one—three to four months—so that he rejects my views on insufficient grounds and brings forward a purely hypothetical and wildly improbable theory.

Taussig agrees with Webster and states (in a footnote) that "Webster has fully pointed out the fallacies of his (Hart's) conclusions." He further states that he has assumed that the vagina is entirely formed by the coalesced Müllerian ducts and not to any extent by the urinogenital sinus (p. 99), *i.e.* he assumes what he should prove or disprove and rejects actual specimens in favour of a mistaken preconception.

Bolk in a recent important paper gives the history well, and his conclusions are as follows:—

"Nach Dohrn entwickelt sich somit die Klappe sekundär, hat nichts mit der ursprünglichen Müller'schen Papille zu tun und ist die hymenale Öffnung eine primäre Öffnung, nämlich das nicht ganz verschlossene Lumen des Scheidenkanales. Doch bleibt immerhin der Hymen eine vaginale Bildung. Eine dritte Ansicht, die hier kurz erwähnt zu werden verdient, ist jene von Berry Hart. Die morphologische Deutung der Scheidenklappe, die dieser Autor gibt, hängt mit seiner Auffassung der Entstehung der Vagina zusammen. Es sollte nämlich der untere Dritteil der Scheide nicht von den Müller'schen, sondern von den Wolff'schen Gängen gebildet worden sein und demzufolge musz der Hymen als ein Produkt der terminalen Enden dieser Kanäle angesehen werden; so sagt der Autor (l. c. S. 342): 'thus the hymen is formed by a special bulbous development of the lower ends of the two Wolffian ducts, aided by an epithelial involution from below of the cells lining the urogenital sinus.' Schliesslich musz die Auffassung von Pozzi erwähnt werden, der den Hymen als eine vulväre Formation deutet, entstanden aus zwei seitlichen Falten, die sich auf die Seitenwände des primitiven Sinus urogenitalis bilden, und einander entgegenwachsend in der Medianlinie sich verbinden.¹ Der Hymen würde somit paariger Herkunft sein und von dem Müller'schen Hügel ganz unabhängig sein.

"Der zweite Punkt betrifft die Herkunft der Vagina. Die älteren Autoren (Müller, Valentin, Rathke) meinten, dass die Scheide eine differenzierter Teil des Sinus urogenitalis war, eine Ansicht, die durch spätere Untersuchungen als nicht richtig erkannt worden ist. Weitaus die meisten Autoren erblicken jetzt in der Vagina ein Bildungsprodukt ausschliesslich der Müller'schen Gänge. Nur einige wenige Autoren nehmen einen etwas anderen Standpunkt ein. Jener von Berry Hart geht schon aus dem Obengesagten hervor, und wird weiter deutlich durch die zwei

¹ Pozzi's view has been classed with those deriving from the external genitals, omitting the fact that he places the urinogenital sinus with them.

folgenden Sätze: 'The upper two-thirds of the vagina are derived from the ducts of Müller, and the lower third is due to the coalescence of the upper portion of the urogenital sinus and the lower ends of the Wolffian ducts' (i. e. S. 344). Auch Kempe hat sich, was die weiße Ratte betrifft, für eine Beteiligung der Urnierengänge an der Bildung der Vagina ausgesprochen" (Bolk, pp. 252, 253).

Bolk's final conclusions are:—

"Kehren wir nach diesem Excurs zu unserem Gegenstand zurück. Auf Grund meiner Untersuchungen bin ich somit bezüglich der Entwicklung der Urethra, des Septum urogenitale, der Vagina und des Hymen zu einer Auffassung gelangt, die von der mehr geläufigen wesentlich abweicht. In den folgenden Sätzen findet man kurz zusammengefasst die Ergebnisse meiner Untersuchung übersichtlich dargestellt:—

"1. Die Urethra des Menschen ist doppelter Herkunft; der obere Teil geht aus der gemeinschaftlichen Blasen-Urethral-Anlage hervor, der untere Teil stammt vom primitiven Sinus urogenitalis her.

"2. Der kaudale Abschnitt des Septum urogenitale beim Menschen entsteht durch ein Zusammenwachsen zweier Falten, die beiderseitig von der Seitenwand des primitiven Sinus urogenitalis sich erheben, einander nähern, in der Medianebene zur Verschmelzung kommen und in dieser Weise das primitive Septum nach unten verlängern.

"3. Die Vagina des Menschen ist doppelter Herkunft; zum grössten Teil geht sie aus dem untern Abschnitt der verschmolzenen Müller'schen Gänge hervor, dieser Abschnitt ist als 'Pars-Müllerica' zu unterscheiden; der untere kleinere Teil (vielleicht etwas das untere Drittel) lässt sich vom primitiven Sinus urogenitalis ableiten, diesen Teil möchte ich 'Pars adjuncta' nennen.

"4. Der Hymen ist eine durch Faltenbildung der Seitenwände des primitiven Sinus urogenitalis entstandene Klappe, die paariger Herkunft ist, durch Übergreifen auf die Hinterwand des primitiven Sinus urogenitalis sich zu einer halbmondförmigen Membran ausbildet und durch eine Verschmelzung auch der vorderen Enden beider Falten sich zu einer mehr ringförmigen Klappe entwickelt.

"5. Das Orificium hymenale ist einer primäre Öffnung.

"6. Das Vestibulum vaginae stellt nur einen Teil des primitiven Sinus urogenitalis dar.

"7. Das Perineum anterius (Carina urethralis) ist entwicklungs geschichtlich progressiver Natur" (pp. 265, 266).

PLATE XIII.

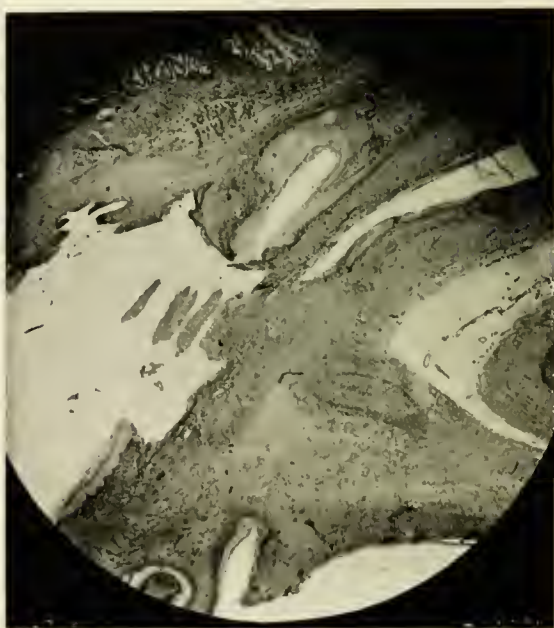


FIG. 6.—Formation of hymen. To left is urinogenital sinus (vestibule) and above Wolffian bulbs breaking down.

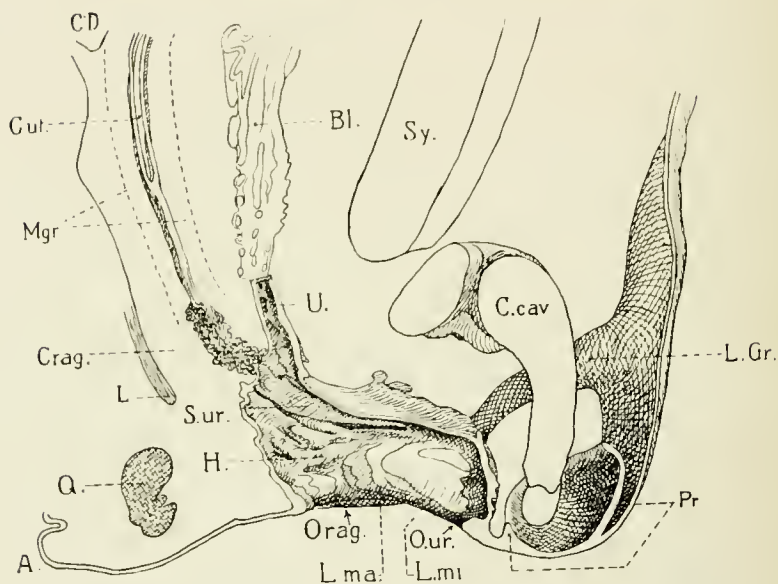


FIG. 7.—Medial section through the urinogenital sinus of a 135 mm. (head-breech length) female embryo, viewed from within. A. Anterior end of anus; Q. M. Sphincter ani; L. Longitudinal muscle of rectum; C.D. Lower end of pouch of Douglas, posterior; C. ut. Cavum uteri; M. gr. Boundary of uterine mesenchyme; C. rag. (instead of vag.) Conus vaginalis; Bl. Bladder; U. Urethra; S. ur. (instead of uv.) Plica septi uro-vaginalis; O. ur. Anlage of the ostium urethrae; Sy. Symphysis; C. cav. Corpus cavernosum clitoridis; Pr. Prepuce fold; L. gr. Boundary opposite labium majus; L. ma. Labium majus; L. mi. Anlage of the labium minus (Spuler, *op. cit.*, fig. 35, p. 628).

My own views, confirmed by Bolk, as stated in 1901, are as follows (*Elin. Obstet. Trans.*, 1900-1, xxvi. 273):—

1. The upper two-thirds of the vagina are derived from the ducts of Müller.

2. The lower third is due to the coalescence of the upper portion of the urinogenital sinus and the lower ends of the Wolffian ducts.

3. The epithelial lining of the vagina is derived from the Wolffian bulbs, which again are epithelial proliferations of the lower ends of the Wolffian ducts. The vaginal mucous membrane is thus ectodermic.

The hymen forms at the Wolffian-ducts-opening and not at the eminence of Müller as usually stated. I think it probable that the Wolffian bulbs block the urinogenital sinus, and that the lumen is re-established as a double one, urethral and vaginal, by an epithelial central resolution and by involutions from the sinus below. Thus in the adult female the vestibule, lower third of the vagina, and lower end of the urethra are derived from the sinus urinogenitalis (pp. 273, 289) (Figs. 6 and 7).

In the new edition of Veit's *Handbuch der Gynäkologie*, Spuler in a comprehensive article emphasises the above views (Bolk's and my own), and gives also his own researches on the comparative anatomy of this region in *cavia*—*felis*, *ovis*, *sus*—specially on the *cavy*.

The following are his conclusions (1908):—

“Bei meinen Untersuchungen kam ich in einem wesentlichen Punkt zu einem von den Bolk'schen abweichenden Resultat. Im November 1907 habe ich in der Erlanger Societas physico-medica mitgeteilt: Die Vagina entsteht nach Untersuchungen an *Cavia*, *Felis*, *Ovis*, *Sus*, speziell an *Cavia*, und auch an menschlichen Embryonen, aus zweierlei Bildungen; aus einem in den Müller'schen Hügel einwachsenden, dem Epithel des Sinus urogenitalis entstammenden ‘Conus vaginalis,’ der sich später beim Menschen ausserordentlich stark entwickelt und den grössten Teil der Scheide liefert, und durch Aufteilung des grösseren Teiles des Sinus urogenitalis durch zwei ungefähr frontal gestellte Falten in einen vorderen Kanal die sekundäre weibliche Harnröhre, und einen hinteren, den unteren Teil der Scheide; nur der kleine ungeteilt bleibende Bezirk des Sinus urogenitalis wird zum Vestibulum vaginae” (Spuler, Veit, v. pp. 620-621).

We may thus consider the view of the entire Müllerian origin of the vagina and hymen as overturned and its origin in part

(upper two-thirds) from Müller's ducts, in part from the upper portion of the urinogenital sinus, as established. Thus the hymen is not an organ of the Müllerian ducts nor of the vulva but of the urinogenital sinus.

The question of vaginal atresia, and especially of atresia hymenealis, is intimately bound up with this whole question. One special point emerges, viz. that in atresia the initial defect is that the non-breaking down of the solid epithelial formation in the vagina and cervix is the central fact to be taken into account in the formation of many of them, and that when this gives a feasible explanation, as it does in most forms, hypothetical inflammatory changes need not be considered. In atresia hymenalis I have always seen the edges of the hymen and an unbroken diaphragm more or less thick between them. Some observers allege that in such the hymen may not be present. It has always seemed to me that the preponderating number of cases, at any rate in which the hymen edges are present, is due to the fact that the development of the hymen is intimately bound up with that of the ducts of such important early secreting organs as the Wolffian ones, organs essential to healthy development, and therefore structures whose absence or malformation entails serious nutritional defects. When the blocking epithelium in the vagina does not break down we get varieties of atresia, and these are easily understood in the light of the development given. Thus when the epithelial plug of the two Wolffian bulbs forming the hymen does not break down we get atresia hymenealis. Very rarely is there a transverse septum an inch from the septum hymen, but I have seen two such, and it is probably the lower end of the true Müllerian vagina, where the eminence of Müller was, that is imperforate. When all the solid epithelium in the vagina does not break down we get complete atresia of the vagina; when only that in the cervix, we get a retention of blood in the uterus hæmatometra (Fig. 8).

In review, then, it will be seen that these two views of the origin of the hymen, viz. from the Wolffian ducts and sinus or from the Müllerian ducts, are sharply contrasted as to the origin of the hymeneal and vaginal lining; the one urges a local change from early protoplasmic cells to squamous multiple epithelium, the other an invasion of squamous cells from the Wolffian bulbs into the Müllerian duct as far as the lower third or so of the cervical canal.

The view I bring forward is an interpretation so far as possible

of what appears to take place during this development and an attempt to explain how the adult tract is formed. Development proceeds from the stage of the double Wolffian and Müllerian ducts and the urinogenital sinus with its single structure, from the blind ending of the Müllerian and patency of the Wolffian ducts, up to the formation of the adult tract, where we find the hymen present, the vagina provided with a skin-like multiple-layered lining, and uterus and tubes with a mucous membrane of a totally different nature. The Müllerian view states that the double Müllerian tubes (vaginal portions) coalesce, the epithelial lining of the hymeneal and vaginal Anlagen becomes converted into a multiple-layered epithelium which first occludes the vagina and then breaks down to form a lumen. A special increase of this epithelium at the lower end of the vagina by its bulging and pressure forms the hymen and hymeneal aperture.

How in the view of the Wolffian origin of the hymen does the vagina get its different lining as compared with the uterus and tubes? By the development of the Wolffian bulbs from an ectodermic source, viz. the lower ends of the Wolffian ducts, their coalescence to form the hymeneal ridges, and the passage of their epithelium into the vaginal tract rendering it solid up as far as the lower third of the cervical canal. If the vagina at this stage of occlusion is examined it will be seen to be, not a mere local proliferation of the epithelium lining its walls, but an actual solid plugging continuous with the epithelium of one of the bulbs. It may be urged that this description of the invasion of the vaginal lumen from the bulbs is an unusual phenomenon and therefore more likely to be an erroneous interpretation, but it is really quite analogous to what happens in the development of other organs; thus the glans penis is tunnelled in the same way, the open urethral canal in the male is closed in the same way, and, to take a simple instance, a sweat gland is first a solid epidermic plug with surface cells central and develops its lumen by these breaking down. In fact, the special value of an epidermic plug as a solid structure, or in the epidermic invasion of a lumen, is that it has in its centre surface-cells with a power of desquamation thus forming the lumen. In the bulbs one sees that the central cells are analogous to the superficial cells of epidermis or vagina, are desquamating to form the hymeneal opening. What happens there, occurs higher up in the vagina in the vaginal fornices, and in the cervical canal in its lowest third, so that the whole genital tract is ultimately pervious and provided in each segment with a lining appropriate to its functions.

From all this it follows, as already said, that adenoma vaginae diffusum is a persistence of an embryological condition due to a practical absence of the epithelium relining the vagina at the third month. It is of great interest to note that malignant disease supervened in Haultain's case.

The question arises as to whether anything can be done for such cases. The only thing I can suggest is either entire excision or that flaps of skin be taken from the labia majora, and by them, after curetting, and in a way I need not detail, a skin covering provided for the vaginal walls.

LITERATURE.—Bolk, *Beiträge zur Affen-anatomie*, vi., "Zur Entwicklung und vergleichenden Anatomie des Tractus urethro-vaginalis der Primaten," mit 33 Figuren; *Zeitsch. für Morph. und Anthropologie*, 1907, x. (p. 250). Gellhorn, G., "Anatomy, Pathology, and Development of the Hymen," *Amer. Gynec. Trans.*, 1904, p. 405. Hart, D. Berry, "Morphology of the Human Urinogenital Tract," *Journ. of Anat. and Phys.*, xxxv. p. 330; also *Brit. Med. Journ.*, 13th September 1902. Klein, *Entstehung des Hymen*, Wien, 1897. Nagel, W., "Entdeckung und Entwicklungsfehler der Weiblichen genitalien," *Veit's Handbuch der Gynäk.*, 1897, Bd. i. Spuler, "Über die normale Entwicklung des weiblichen Genitalapparates," *Veit's Handbuch der Gynäk.*, v. p. 576, Bergmann, Wiesbaden, 1910. Taussig, "The Development of the Hymen," *Amer. Journ. of Anat.*, 1908. Webster, "Early Wolffian and Mullerian Ducts," *Amer. Gynec. Trans.*, 1898. Wood Jones, "The Nature of the Malformations of the Rectum and Urinogenital Sinus," *Brit. Med. Journ.*, 14th December 1904. For full literature see Spuler and Gellhorn.

ECLAMPSIA ORIGINATING IN THE PUERPERIUM.

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SCOTLAND has an unenviable notoriety in the matter of eclampsia. We have a considerably greater proportion of cases than any other portion of the British Isles and most parts of the Continents of Europe and America. Whether this is due to climatic, or to dietetic, or to racial peculiarities, is as yet unknown. The moral, however, is obvious, and places upon us a certain responsibility in regard to the study of this most baneful condition. No apology, therefore, is needed for trying to focus attention for a short time upon one of the more uncommon varieties of the disease—that which originates in the puerperium.

Several reasons unite to make it desirable as well as interesting to consider this variety of eclampsia apart from the more common forms occurring in pregnancy and labour. In the first place, the time of the occurrence makes it an even more alarming and disconcerting complication than usual, for, after delivery is safely over, it is both natural and legitimate to look forward to an easy and uneventful period of recovery. The sudden onset of convulsions is therefore calculated to create something little short of consternation in the mind of the physician, as well as of the relatives and friends, who have all come to regard the troublous and dangerous time as over.

As it is the exception for eclampsia to occur during pregnancy without warnings which are legible to those who take the trouble to look for them, so it is rare for eclampsia to originate in the puerperium without warnings of some sort having been present beforehand. But after labour is safely over such warnings, even if they have been recognised, are very apt to be forgotten or masked. It is this that makes post-partum eclampsia so often appear to be an unexpected and fulminant disaster.

Again, post-partum eclampsia is not easily brought into line with the other forms in regard to its causation. No theory up to the present has satisfactorily explained the cause of eclampsia in its more common forms, but almost all theories become more or less abject failures when an endeavour is made to fit them to the problem of post-partum eclampsia.

Speaking generally, this variety occurs about once in every five eclampsias. In the Maternity Hospital of this city the exact proportion is 12·6 per cent., but taken all over it is probably about 20 per cent. These figures, of course, only refer to those cases which *originate* for the first time after labour, not to cases in which the fits continue from the time of labour or pregnancy. In its nature the condition, as it occurs for the first time in the puerperium, differs in no way from the usual. There are generally prodromal symptoms. Both the symptoms and physical signs, however, are apt to be masked by the preceding labour. It is most usual for the attack to come on within a few hours of labour, and thus the prodromal symptoms may either not have time to declare themselves, or they may be regarded merely as the after-effects of the strain of parturition. In this way, for example, general malaise, headache, and even epigastric pain may be misinterpreted. Similarly, the condition of the urine, which is the great physical sign in these cases, is rendered difficult of interpretation by the admixture of the lochia, and a catheter specimen has to be obtained before anything can be deduced from it. For this very reason the routine examination of the urine is scarcely ever made, and so we miss the danger signal that it so often gives us during pregnancy.

The time of onset is, as has just been mentioned, usually within the first twelve hours of the puerperium. A very characteristic record, for example, is given by eighteen cases of the kind in the Maternity Hospital in Edinburgh, whose records I have been enabled by the kind permission of the staff to examine.¹ Four of these began within one hour of delivery, six more before twelve hours had elapsed, three between the twelfth and twenty-fourth hours, three on the second day, one on the third, and one probably genuine case on the eighth day after labour. Similarly, of twenty-two cases recorded by Meyer-Wirz,² eighteen began on the first day, two on the second, one on the fourth, and one on the fourteenth day after labour.

It is very doubtful if such cases as the last can be regarded as true eclampsia at all. Probably all cases occurring after the first week or thereby are really cases of uræmia dependent on chronic organic lesions of the kidneys. There are, however, on record numerous cases of so-called eclampsia originating long after that time. Baudelocque,³ for example, to quote only the giants, records one on the forty-fifth day, and Sir James Simpson⁴ published two occurring in the eighth week. The modern conception of eclampsia

forces one to the conclusion that these must have been cases of uræmia from chronic nephritis, and their connection with the puerperium largely accidental.

The *number of fits* is usually small—frequently just one or two. The greater the number of fits, the more grave the case becomes.

I should like here to interpolate the record of a fairly characteristic and very interesting case which was admitted to the Edinburgh Maternity Hospital some months ago, and which I am enabled to publish through the kindness of Professor Sir Halliday Croom :—

The patient was a woman of 30, who had had five children previously. Her general health had been good, with the exception that she had once or twice had fits, quite apart from pregnancy. There was said to have been swelling of the ankles before the birth of all her children. After the fourth labour she had “fits”—two hours post-partum. During this last pregnancy she had suffered from excessive salivation, and two months before term from swelling of the face and ankles, headache, and giddiness. There was pain on micturition, and a diminution in the quantity of urine. During the last two months she complained of pain “below the right breast.” Labour ensued on 14th December 1910, and was normal. At the time her face and ankles were somewhat swollen. Nine hours after labour this condition was observed to be increasing, and the urine was found to be loaded with albumen. Later she complained of feeling ill, the pain under the right breast became greatly aggravated, and the pulse was noticed to have run up to 132 per minute. Exactly twelve hours after labour she had two fits in rapid succession, and remained quite unconscious subsequently. In this state she was admitted to the hospital, comatose, breathing stertorously, and with a pulse of 100, blood-pressure 195 mm. of Hg, and temperature 99·6° F. She was immediately bled and 2 pints of normal saline solution passed into the vein. The stomach was washed out and 6 ozs. of Henry’s solution left in it. The rectum was washed out with a copious result, and a pint of saline solution left in the bowel. The blood-pressure promptly fell to 115 mm., and 6 ozs. of urine were drawn off. This was found to be loaded with albumen and blood, and to contain a quantity of urea so small that it could not be estimated. After this the bowels and kidneys acted freely. She was treated with further saline infusions and stimulants, but gradually sank, and died twenty-four hours after labour. About two hours before her death she rapidly became very jaundiced.

At the post-mortem examination the following points among others were noted :—

Lungs—(Edema and congestion.

Liver—No alteration in size ; an extensive subcapsular hæmorrhage

principally over the left lobe; colour, light yellow; on section extensive fatty change is seen, the fat globules being small and numerous within the liver cells; sections stained with hæm.-eosin show hæmorrhages and characteristic areas of focal necrosis.

Kidneys—Somewhat enlarged, fairly firm in consistence; on section cortex slightly swollen, pale and opaque. Frozen sections show characteristic appearances of acute catarrhal nephritis.

This case illustrates a number of interesting points. There is, in the first place, the existence during pregnancy of definite warning signs and symptoms in the swelling of hands and face, giddiness, diminution in the quantity of urine, and, lastly, in the pain under the right breast. This last is a symptom of peculiar interest, especially in view of the fact that it became so much more intense just before the onset of the acute symptoms. Severe pain in the epigastric or right hypochondriac regions is not very uncommon in eclampsia, but it has hardly received the attention that is its due. Cases have been recorded in which it was the *only symptom* preceding an attack of convulsions. So far as I am aware, the only explanation that has been offered is Olshausen's⁵ suggestion, that it is due to the secretion into the stomach of some pathological substance. Such a substance has, however, never been demonstrated, and washing out the stomach does not appear to relieve the symptom. For these reasons, and also because the liver in eclampsia is vastly more subject to morbid changes than the stomach, it seems not unlikely that it is a referred pain due to morbid processes going on in this viscus. In the individual case before us the acute exacerbation of the pain shortly before the fits began may be taken as corresponding to the acute stage of the toxic process indicated at the autopsy by the hæmorrhages into the substance, and more particularly under the capsule of the liver. Be the explanation, however, what it may, it is important to bear in mind the possible significance of such pain, as in post-partum eclampsia it may well be the only symptom that is not obscured and masked.

In the second place, this case was surprising in its morbid anatomy. Having regard to the history of puffiness of the face and ankles in *all* her previous pregnancies, and to the previous attack of convulsions after the fourth confinement, one would certainly have expected to find some definite chronic organic change in the kidneys. Both macroscopic and microscopic examination, however, showed changes characteristic of recent acute catarrhal nephritis, and of that alone. The liver also showed lesions typical of acute eclampsia, and no chronic changes. The case, therefore,

affords proof of the purely toxic nature of eclampsia, as well as of the fact that non-fatal attacks may pass off and leave no permanent damage to the organs most affected. This in its turn partially explains the generally recognised fact that one attack of eclampsia recovered from usually confers immunity from further attacks in subsequent pregnancies.

The *prognosis* in post-partum eclampsia is a curiously unsettled point. The general trend of opinion amongst those who have written on the subject is that it is usually a more benign form than either ante-partum or intra-partum eclampsia. This on the whole seems to be borne out by most tables of statistics. The mortality in the eighteen cases in the Edinburgh Maternity Hospital, to which I have referred, was 33 per cent., or about one in three, but, if we take the figures of several authors, we find the proportion varying from 5 to 43 per cent., and we find opinions recorded corresponding to both extremes. Thus of six cases seen by Sir Halliday Croom five died. Again, three out of four cases died in St. Mary's Hospital, Manchester, in 1908.⁶ Dr. Fletcher Shaw,⁷ the pathologist to that hospital, in a short note in the *British Medical Journal* states that of eight cases of the kind in the hospital during four years only one recovered—a mortality of 87 per cent. There are therefore not wanting those who regard it as the most dangerous form of eclampsia, and the question remains whether there is not some explanation which will reconcile these very divergent views.

It would be tedious to discuss the various theories of the etiology of eclampsia, and note exactly where and how they fail to fit the problem of post-partum cases. Those interested will find such a discussion elsewhere.¹ Suffice it that no theory based upon the presence of the foetus or placenta will answer, nor has any fully satisfactory theory of disordered metabolism yet been formulated.

Dienst,⁸ one of the greatest European authorities on the subject, inclines to regard post-partum cases as due to the products of the involution of the uterus. He attributed it to partially oxidised products of involution passing into the circulation and embarrassing the liver. Since that view was put forward our knowledge has increased along two lines. In the first place, it is now supposed that eclampsia is due to autolytic ferments passing from the placenta to the liver and kidneys, and in these organs setting up a process of autolysis. In the second place, recent work on the nature of the processes involved in the involution of the uterus has shown that that also is to some extent a process of autolysis. It therefore seems quite conceivable that in

some cases the ferments associated with the involution process may pass into the circulation and reach the liver, and there start the destructive process.

I believe, however, that, so far as our present knowledge goes, no one theory will explain all cases of post-partum eclampsia. I think that we must regard them as falling into two classes. Those cases that arise within, say, the first twenty-four hours of labour are, in all probability, due to the same cause as is productive of the condition during pregnancy and labour—presumably to placental ferments. On the other hand, those cases that arise later, especially on and after the second day, may quite possibly be due to the same process set up by ferments, not from the placenta, but from the involuting uterus.

Such a division into early and late cases (although I do not know where exactly the dividing line is to be drawn) enables us to form some explanation of another interesting observation. Olshausen⁵ noted in his series of cases that, where the attack came on early, the fits were usually few in number and the prognosis uniformly good; but where the attack came on later, the fits tended to be more numerous, and the prognosis bad. In order to test this observation I append an analysis from this point of view of the eighteen cases in the Edinburgh Maternity Hospital to which I have already referred. It will be seen that they confirm Olshausen's view to a great extent, cases originating after about thirty-six hours tending to have more fits, and certainly being more fatal.

ONSET WITHIN 24 HOURS AFTER LABOUR.

| No. | Time of Onset. | No. of Fits. | Result. |
|-----|---------------------------------|--------------|---------------------|
| 1. | $\frac{1}{2}$ hour after labour | 23 | Death. |
| 2. | 1 " " | 1 | Recovery. |
| 3. | 1 " " | 2 | " |
| 4. | 1 " " | 3 | " |
| 5. | 2 " " | 2 | " |
| 6. | $5\frac{1}{2}$ " " | 2 | " |
| 7. | $6\frac{1}{2}$ " " | 1 | " |
| 8. | 10 " " | 5 | " |
| 9. | 10 " " | 10 | Death. |
| 10. | 12 " " | 2 | Death. ¹ |
| 11. | $19\frac{1}{2}$ " " | 1 | Recovery. |
| 12. | 21 " " | 1 | " |
| 13. | 23 " " | 3 | " |

13 cases; 3 deaths; mortality = 23 per cent.

¹ Case recorded in detail above.

ONSET FROM 24 TO 48 HOURS AFTER LABOUR.

| No. | Time of Onset. | No. of Fits. | Result. |
|-----|-----------------------|--------------|-----------|
| 14. | 36 hours after labour | 9 | Recovery. |
| 15. | 48 " " | 2 | " |
| 16. | 48 " " | "many" | Death. |

3 cases ; 1 death ; mortality = 33 per cent.

ONSET AFTER SECOND DAY OF PUERPERIUM.

| No. | Time of Onset. | No. of Fits. | Result. |
|-----|----------------------|--------------|---------|
| 17. | 2½ days after labour | "many" | Death. |
| 18. | 8 " " | 3 | Death. |

2 cases ; 2 deaths ; mortality = 100 per cent.

Now in all toxic affections of the nervous system there are two factors to be considered—firstly, the condition of the nervous system as to stability, and, secondly, the dose or virulence of the poison. Thus in a patient of unstable nervous equilibrium, or with a nervous system weakened by disease or strain, a small dose of poison may well be sufficient to precipitate convulsions. On the other hand, in a patient of more stable nervous equilibrium a more massive dose or a more potent poison will be required to produce the fits.

Bearing in mind these considerations, may we not regard the early cases as induced by a poison existent during pregnancy and labour, but of such low potency that it is unable to affect the nervous system to any manifest degree, until after the latter has been weakened by the strain of labour? This weakness (or the small dose) of the poison explains the small number of fits and the generally good recovery. Late cases, on the other hand, may be regarded as due to a gradually accumulating dose of poison, resulting from the activity of ferments from the involuting uterus. Obviously this source of ferments, if such it be, will become increasingly productive as the process of involution goes on. Hence the probability of a greater number of fits, and the increasing frequency of a fatal termination. I believe that some such explanation as this must be at the root of the really remarkable divergence of opinion as to prognosis that has already been mentioned.

It may be objected that the case narrated above does not tally with this theory—that it was an early case, that the fits were only two in number, but that in spite of this the patient died.

Against this, however, we must put the facts that (1) she had, as shown by her history, a nervous system of decidedly unstable equilibrium, and one apparently susceptible to poison; and (2) the nervous system had been slowly poisoned during pregnancy, as evidenced by the excessive salivation and the œdema of face and limbs. In this case, therefore, we have the weakness of the poison to some extent counterbalanced by a susceptible and already partially poisoned nervous system, and so the fatal result is not surprising.

There is no need to enlarge here upon the subject of *treatment*. There can, of course, be no obstetric treatment, unless there be reason to suspect that some portion of the placenta has been left in the uterus. If such should be the case, its removal may have to be considered. The main principles of treatment must be to promote elimination by every possible channel. Thus the lower bowel should be washed out freely, and hot saline solution may with advantage be left in it to stimulate the kidneys, as well as by absorption to dilute the toxins. The stomach should also be washed out if possible, and it is well to leave in it several ounces of a strong saline purgative—Henry's solution, for example. Hot packs may be required to stimulate the skin's action, and bleeding from the median basilic vein is very useful where the blood-pressure is high. The patient must be kept absolutely quiet in a darkened room, and protected as far as possible from noise and other external stimuli. Feeding is probably better avoided during the acute stages. The patient will be able to exist on the saline fluids, which should be regularly administered either by the bowel, or by hypodermic injection into the loose cellular tissue under the breast, or by intravenous injection. Administration of ether by the open method may be necessary to control the fits; chloroform should be avoided owing to its action on the liver.

The post-partum variety of eclampsia, when accompanied by complete or almost complete anuria, is the indication *par excellence* for the operation of decapsulation of the kidneys. Since this operation was introduced by Ehebohl's for the relief of chronic nephritis, it has been tried in cases of eclampsia some thirty or forty times. The results have not been brilliant, but with a more careful choice of cases they may be expected to improve. Post-partum cases are the most suitable, because before or during labour

one would hardly feel justified in adopting such a drastic measure without first trying the effect of the evacuation of the uterus. I have had the opportunity of seeing this operation carried out in one case in the Maternity Hospital here. The result was conspicuously successful.⁹

Finally, in regard to prophylaxis. Although cases of this kind are rare, still they serve to remind us of the danger incurred by want of attention to the warning signals exhibited during pregnancy. It is not enough that cases showing toxæmic symptoms during pregnancy should receive special care up to the time of labour. The early days of the puerperium require equally careful watching. It is no longer possible to avoid the conclusion that eclampsia is, in the great majority of cases, a preventable condition, and this applies not merely to the ante- and intra-partum varieties, but, with a little additional exercise of care, to post-partum cases likewise.

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CLINICAL RECORD.

A CASE OF ADENOMA OF THE VAGINA UNDER
OBSERVATION FOR FIFTEEN YEARS.

By F. W. N. HAULTAIN, M.D.

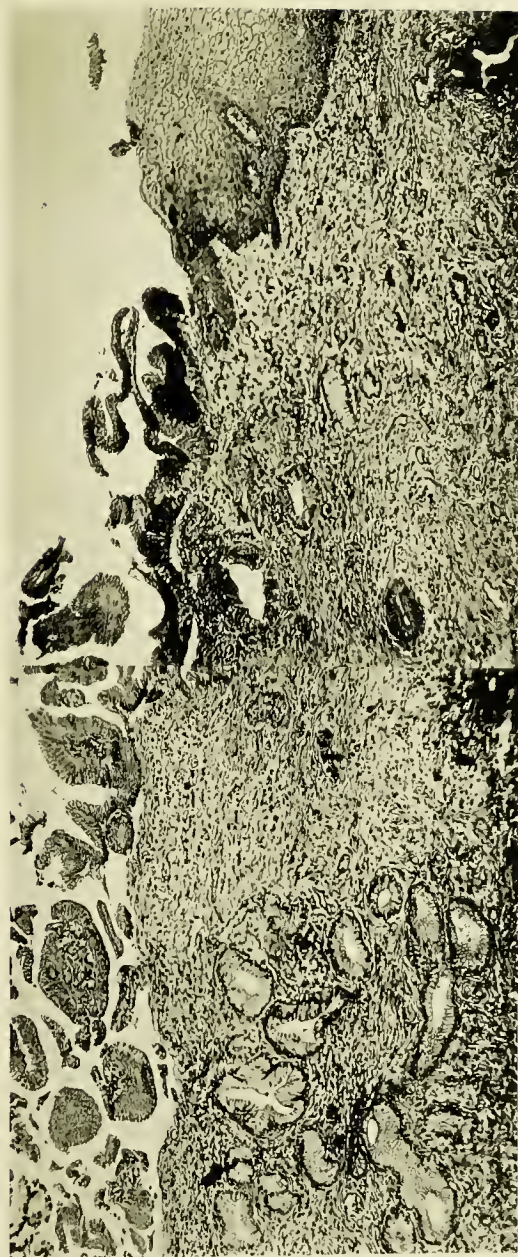
IN September 1896 I was consulted by Mrs. S., aged 35, who complained of a copious watery discharge from the vagina and something protruding from the vulva. On examination I found a swelling of the anterior vaginal wall, which protruded slightly from the vulva and simulated a cystocele. It was hard and well defined—about the size of a walnut. The vaginal walls were of an intensely pink colour, and secreted freely a thin watery discharge.

I removed the swelling on the anterior vaginal wall, which though apparently well defined was extremely difficult to enucleate. On section it presented the appearance of a fibro-adenoma. I intended to show it at the Obstetrical Society, but, unfortunately, my museum was burned and the specimen destroyed. I at the same time removed a portion of the vaginal wall and found it covered with an adenomatous structure, which closely resembled the appearance of a cervical erosion. Subsequently I thoroughly scraped the vagina and swabbed it with tincture of iodine, in the hope that I might destroy the glandular growth.

For some months she was much better, but returned later with the same watery discharge. As the vagina presented a similar appearance as before, I repeated the curetting and swabbed with pure carbolic. This, again, cured the discharge for a period of about eighteen months, but it reappeared, and the vaginal walls presented the same pink appearance. As she was much averse to any further operative procedure, I recommended syringing with astringents such as alum and sulphate of copper, but these exercised very little beneficial effect.

I lost sight of her entirely until June last year (1910), when she again consulted me, complaining of severe heat in the vagina and frequency of micturition. On examination I now found the vaginal walls greatly thickened, of the same pinkish colour, and showing warty-like protuberances on the surface. I again excised a small portion of the vaginal walls for diagnostic purposes and found it to show, as the microscopic specimen demonstrates (Plate XIV.), the same adenomatous character as previously, but very much more exaggerated, the glands now penetrating and replacing the squamous epithelial covering and dipping deeply into the muscular tissues. She was now soiling

PLATE XIV.



DIFFUSE ADENOMA OF VAGINA.

On right, ordinary squamous epithelial covering; on left, papillary glandular covering with adenomatous infiltration of vaginal wall.

from eight to ten diapers a day with the thin watery discharge, and said she had done so more or less for the last eight years. At no time had she complained of irregular hæmorrhage, and there was no evidence of ulceration by examination. She gradually became weaker, and died of pure asthenia on the 15th March last.

Beyond considerable discomfort from her bladder, there was no great pain suffered. Unfortunately post-mortem examination was refused.

There can be little doubt that the case was a typical example of a diffuse adenoma of the vagina, simple in its early stages, but eventually in the course of time, from penetrating the surrounding structures, becoming what might be termed adenoma malignum.

A similar case in its early stages has been described by Bonney, and was stated by him to be unique, so that the condition must be considered of great rarity.

In these days of thorough surgical interference I would not hesitate, if a similar case presented itself, to remove thoroughly the uterus and vagina, as it seems to me that, though simple in origin, all such cases must tend eventually to pursue the course which was followed in this instance. As to the origin of this extraordinary condition I am not prepared to give an opinion. Both Berry Hart and Bonney consider it to be due to some developmental anomaly associated with the Wolffian ducts. These, as is well known, are supposed to account for the formation of vaginal cysts, which, however, differ very much in the character of their epithelium from the case above described. This, as is shown in the micro-photographs, is of a cylindrical type, resembling closely the lining of the cervical glands. It is possible, therefore, that the condition may be due to an exaggerated formation of cervical erosion spreading to the vaginal walls.

MEETINGS OF SOCIETIES.

Edinburgh Obstetrical Society.

THE sixth meeting of the session was held on 10th May 1911, Dr. Haultain, President, in the chair.

The President exhibited (a) photographs of an œdematous foetus; (b) sarcoma of the uterus; (c) extra-uterine pregnancy, with perforation of uterus; (d) microscopic sections of diffuse adenoma of vagina.

The President read a "Note of a Case of Adenoma of the Vagina," which appears in the *Journal* (p. 600).

Dr. Berry Hart read a paper on "Adenoma Vaginæ Diffusum (Adenomatosis Vaginæ)," with a critical discussion of vaginal and hymeneal development, which we publish *in extenso* (p. 577).

The Secretary read a communication by Dr. A. E. Turnbull, Broadway, Dorset, entitled "Short Note of a Case of Superfœtation." The patient, a primipara, æt. 24, was attended by Dr. Turnbull in her confinement on 11th March of this year. She then considered herself about $6\frac{1}{2}$ months pregnant, but was very uncertain. Labour had commenced about 3 A.M., the membranes rupturing an hour later. On Dr. Turnbull being called at 5 P.M. he found the uterus extending to the xiphoid cartilage, tender on percussion, and obviously over-distended. The nurse asserted that the membranes had ruptured, and this was confirmed on vaginal examination, when the os was found nearly fully dilated and a head presenting. A diagnosis of twins was made, the large size of the uterus being put down to an excess of liquor amnii with the second ovum. Pains being ineffectual, the first child was delivered by forceps. The membranes of the second child were ruptured, liberating a very large quantity of liquor amnii, and a little later the second child was born. There was a single large placenta, a single chorion, and two amniotic sacs. As the membranes came away another body also came out of the uterus. This proved to be a third ovum, complete and healthy, containing a fœtus of about $3\frac{1}{2}$ months. Unfortunately, almost immediately afterwards, whilst the doctor's attention was occupied with the mother, the nurse destroyed this along with the placenta and membranes. The twins lived only a few hours and the mother made a normal recovery. The twins appeared not to be older than 6 to $6\frac{1}{2}$ months.

The author concluded that the case was one of superfœtation, firstly a uniovular twin pregnancy with hydramnios of one sac, then fertilisation of the second ovum, evidently about 3 months after the first. He claimed that it proved that ovulation continued at any rate during the early months of pregnancy, in which case fertilisation of a second ovum was possible so long as the decidual space remained, that is up to about the end of the fourth month.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

OBSTETRICS AND GYNECOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.,
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ANÆSTHESIA IN OBSTETRICS.

SINCE Sir James Simpson first used ether in midwifery practice, on 19th January 1847, and since he replaced that agent by chloroform in

the November following, sixty-four years have passed away, and countless women have had the pains of labour assuaged by one or other of these anæsthetics. But there has been a constant striving after other means and other methods of producing the same results, or, according to the innovators, better ones. Many new agents have been introduced, lauded, criticised, and abandoned again, but of the more recent introductions scopolamine seems to have impressed itself more upon the attention of the profession than many others.

Professor Lequeux's review of scopolamine in midwifery (*L'Obstétrique*, 1911, N. S. iv. 165) occupies sixty-nine pages of a journal, and is thorough and painstaking. In this full account the history of the method is given, statistics are collected, and various opinions are analysed. Steinbuchel introduced scopolamine into obstetrics, and Gauss pushed its employment so enthusiastically that it has sometimes been called Gauss's method.

To the English reader it is significant that nearly all the names of the obstetricians who have praised it or who have criticised it are not British but continental, although it has found supporters as well as critics to some extent in America. It may be said, therefore, that the question whether or not scopolamine is to be the obstetrical anæsthetic of choice is being decided outside the borders of the United Kingdom. Whilst it may not be generally admitted that the scopolamine-morphine method has been found wanting, it cannot be denied that it has met with much opposition from Hocheisen and many others (Bardeleben, Gminder, Veit, Bumm, Steffen), that it has been severely criticised, and that it has been shown to be not free from danger. Lequeux has endeavoured to form just conclusions on the matter, to some of which I may here refer.

The scopolamine method aims at producing a state of partial sleep (*demi-sommeil*) in which the pains of labour shall be little felt and yet the consciousness of the woman maintained, in which the uterine contractions shall not be enfeebled, in which the fœtus shall not suffer, and in which no painful memories shall remain after the labour is over. How these *desiderata* have been met is told in a critical and yet judicially fair way by Lequeux.

With regard to the doses and technique of the administration of the scopolamine-morphine the conclusion is formed that it is a delicate procedure, requiring prudence and constant watching, and that it ought therefore to be employed only in hospital; that the right dose is difficult of establishment, its usefulness being based on the antagonism of the two drugs which compose it, and which may not completely neutralise one another; and that the morphine is perhaps more to be feared, but that the scopolamine alone may cause danger. A perfectly safe dose may not produce the desired effect, whilst an adequate one may introduce risks. Whilst it has been employed in all sorts of cases, in normal or

morbid labours, in spontaneous or instrumental confinements, with healthy women and with women suffering from the most grave disorders of pregnancy, there is now a marked tendency to restrict its use to healthy women suffering from no cardiac, pulmonary, or renal lesions, and with the single and essential object of lessening the intensity of labour pains by the production of *demi-sommeil*. When we compare, therefore, scopolamine-morphine with chloroform we must at once recognise that the range of applicability of the former is markedly restricted.

In its general action on the woman in labour scopolamine-morphine has been found to exhibit certain smaller inconveniences, such as dryness of the skin and mucous membranes, diminution in the glandular secretions, more or less marked mydriasis, and some quickening and excitement of the pulse. More serious symptoms have been met with, such as delirium, disordered heart action, and more or less marked signs of asphyxia. Individuals react unequally to the drugs, and unexpected idiosyncrasies are met with. Elaborate observations have been made on the local effects of the scopolamine method, and the results are not easy of summation. It is difficult to understand the optimism of a few enthusiasts in view of the experiences of others, and even of their own. For instance, one observer is absolutely satisfied, but admits one maternal death and eleven infantile ones. Many think that it only lessens pain imperfectly, and that the patient is not so much saved from suffering as prevented from remembering it. As one writer puts it — "*la femme accouche comme dans un délire*." But a more serious criticism is that the uterine contractions are unfavourably affected, and that the action of the abdominal muscles is partially or completely arrested. Thus the second stage is apt to be prolonged, and Hocheisen speaks of the foetal head resting for several hours on the vulva, and of the patient making great efforts without the abdominal muscles showing any response. It seemed to him as if the innervation of the parts was disturbed; to him the scopolamine method seemed to be not humane. The result is that all sorts of attempts have to be made to extract the head, and that inertia of the uterus and all its unfavourable sequelæ, such as post-partum hæmorrhage, are to be feared. It seems, however, to have no ill effects on the puerperium and on lactation. It is when inquiry comes to be made into the action of the anæsthetic agent upon the fetus that its full danger is made manifest. At the best, and even if one adopts various explanations and qualifying circumstances, the results as regards the infants cannot be called reassuring. A considerable number of the babies are born in a state of torpor, or what has been called oligopnoic sleep; some exhibit no respiratory movements for several minutes. Asphyxia is very frequent, and the infants are then resuscitated, sometimes with more and sometimes with less ease. The reports of nearly all observers contain foetal mortality. It is true

that the infantile deaths may be explained away as due to the delay in labour and the instrumental means employed, but the question may be fairly asked whether these circumstances, in their turn, have not been caused by the scopolamine-morphine method.

Another aspect of the subject calls for comment, viz. the use of the scopolamine-morphine method in combination with other anaesthetics. Various associations have been made—thus it has been used with chloroform, with ether, with chloroform and ether, and with veronal; and it has been urged in support of the scopolamine method that if in any case of confinement it became necessary to induce anaesthesia by inhalation (chloroform or ether), the previous injection of the scopolamine and morphine did not have any evil consequences, and did not prevent recourse being had to general anaesthesia. When, however, one remembers how free from risk chloroform and ether have proved themselves to be in obstetric practice on account of the special circumstances (circulatory, respiratory, and psychological) of a confinement case, it seems a most unnecessary procedure to anticipate the giving of the chloroform by the injection of the hyoscine and morphine. Further, all authorities, even those who speak most warmly of the *demi-sommeil* method, admit the existence of contra-indications. Thus circulatory disturbances, such as uncompensated valvular lesions with rapid pulse and arrhythmia, grave pulmonary affections, the febrile state, general feebleness, renal affections (*e.g.* eclampsia), acute anaemia, weakness of the uterine contractions, and a tendency to hæmorrhages, and especially to placenta prævia, have all been named.

When one puts together all the facts that have been named, the impression deepens that scopolamine-morphine narcosis does not present the profession with an anaesthetic method in labour superior to chloroform or ether inhalations; and that conclusion is reached without invoking the additional argument of the facility with which inhalation can be begun when needed and suspended when the necessity has passed, as contrasted with the fact that when once the scopolamine-morphine has been injected, its effect is produced whether or not the labour progresses in the desired manner and at the anticipated rate.

NEW BOOKS AND NEW EDITIONS.

The Physiology of Reproduction. By FRANCIS H. A. MARSHALL, M.A. (Cantab.), D.Sc.(Edin.), &c., with a Preface by Professor E. A. SCHAFER, and Contributions by WILLIAM CRAMER, Ph.D., D.Sc., and JAMES LOCHHEAD, M.A., M.D., &c. London: Longmans Green & Co. Price 21s. net.

THIS is a markedly able work, and one that will be welcomed by physiologists and obstetricians. The author not only displays an

accurate and extensive knowledge of the subject, but in some of its aspects the original work he has done and included in it increases the value of several of the chapters.

Chapters X. and XI. on Foetal Nutrition, the Placenta, and the Changes in the Maternal Organism during Pregnancy are contributed by Dr. James Lochhead, and Chapter VIII. on the Biochemistry of the Sexual Organs by Dr. W. Cramer. These are very difficult subjects to treat of, and the author has greatly enhanced the utility of the book by entrusting these parts of his subject to two investigators so competent to deal with them.

One turns naturally to the chapters on Menstruation. Human menstruation has had great light thrown on it by the comparative work of Heape, and by that of the author in co-operation with Jolly, so that the result of the description is to give one a clearer account of this complex function and its relation to its forerunners in lower mammals. The essential similarity between the menstrual cycle in the primates and the oestrous cycle in the lower mammalia is clearly established, as well as the equivalence of the pro-oestrus in the last to the menstrual cycle in women.

The facts as to the corpus luteum are thoroughly discussed, and the anatomy and functions of the reproductive organs well and accurately given.

So many disputed and disputable points are raised in many of the subjects described that one, if tempted to discuss them, could go far beyond the ordinary space allowed. Thus the factors determining sex are carefully considered, but all that is said on this only leaves one as much in the dark as ever, the only gleam of light being the evident failure of the route of the solution *via* the chromosomes to clear up the matter.

In the biochemistry of the sexual organs Dr. Cramer has described simply and clearly many facts of great value, and put the whole matter not too technically. A non-expert on this subject soon gets beyond his depth in any attempt to get knowledge from ordinary sources, and the account given here is therefore specially valuable to him.

Lochhead's contribution is a very fine one, especially in the description of foetal nutrition. Such an account is of the greatest value to the obstetric student and teacher, and should do much to clarify obstetric teaching on a much neglected subject.

The only unsatisfactory part is that dealing with spermatogenesis and oogenesis. The author is here one-sided, merely considering the views of one school, and that a slowly dying one. The view that the germ- or sperm-epithelium gives rise to the primitive sex-cells assumes that their source is to be found within the limits of the sex glands, in view, however, of the fact that in fishes, birds, and mammals the

primitive ova are found in the developing embryo *en route* for the sexual gland, another striking explanation must be considered. The recent work of Allen, King, and especially of Rubaschkin, along with that of Boveri, gives us a theory of the early zygotic origin of the sex cells which really helps heredity. The statement at page 124 to the effect that "the ova, the follicular epithelial cells, and most probably also the interstitial cells, are all derived from the germinal epithelium" is most inadequate in view of what we now know of early embryology and of heredity and its unit-characters. The orthodox explanation makes no distinction between a sex-cell and a somatic one. When Waldeyer in 1870 gave his view of the origin of the primitive ova no other one was possible, and the simple basis in it of mere juxtaposition of sex-cell to germ epithelial cell, has had a fatal fascination in human anatomy. Waldeyer, however, in Hertwig's *Handbuch der Entwicklungslehre* (1906), says distinctly (i. 160):—

"Mehr und mehr häufen sich in den beiden letzten Jahrzehnten Befunde welche dafür sprechen dass die Geschlechtszellen, wie wir die Spermien und die Eier-einschliesslich ihrer Vorstufen—im allgemeinen bezeichnet haben, eine besondere Art von Zellen darstellen, die bereits in den ersten Stadien der Furchung auftreten, sich von den übrigen Zellen, die sonstigen Teile des neuen Individuums, insbesondere dessen Gewebe bilden, den somatischen oder Körperzellen, alsbald sondern und in ununterbrochener Vermehrungsfolge den sämtlichen Spermien oder Eiern eines männlichen bez. weiblichen Individuums zur entwicklungsgeschichtlichen Grundlage dienen."

The statement at page 122 that "both follicle cells and interstitial cells are . . . still potential ova" is quite out of touch with modern work. It may seem ungracious to write thus of one part of such an outstanding and able book where the author, more than any other, has investigated intricate points, read largely, and thought deeply, but it is done in the hope that in a new edition, which should come soon, he will reconsider his views in the same broad and fairminded spirit so prominent in the other parts of the present book.

The whole work has great literary merits, and the quotations at the head of each chapter are apposite. The aphorism of Matthews Duncan at page 75 the reviewer heard in the form, "Menstruation is like the red flag at the auction-room door, showing there is something more important going on inside."

The book is appropriately dedicated to Mr. Heape, and there is a short commendatory preface by Professor Schäfer, so that this most promising *débutant* has good sponsors.

A Manual of Gynecology. By THOMAS WATTS EDEN, M.D.(Edin.), F.R.C.P.(Lond.), F.R.C.S.(Edin.). With 272 Illustrations in the Text. Pp. 632. London: J. & A. Churchill. 1911. Price 18s.

THE author presents this as a complete manual for students and general practitioners.

As such it fulfils the purpose for which it is presented fairly well. It has been planned rather upon clinical and practical relationships, and does not pretend to enter exhaustively into the pathology of the various conditions.

As far as it goes the most recent advances in research are incorporated, and we are glad to see that the author is inclined towards the most recent views on endometritis; and although for teaching purposes the classification of Ruge is useful and is still retained in this manual, the author recognises that revisal of classification must follow recent investigations on this subject.

We do not agree that hernia of the ovary is usually an acquired condition, nor that hysterectomy with conservation of the ovaries leads to an artificial menopause, nor do we agree that vaginofixation if properly carried out in suitable cases is less favourable in its results than ventrifixation.

We think that in any text-book of gynecology the urinary organs should be at least referred to. No mention is made of cystitis, an omission which, from the practical point of view, is a glaring one. In describing the method of treating perineal rupture by operation, no mention is made of the importance of the levatores ani in all but slight cases.

In spite of the above criticism the manual is an excellent one. The context is clear and very readable.

The method of arrangement is much the same as that adopted in most books of its kind.

It gives a concise and clear résumé of the subject, and cannot fail to be appreciated by the student.

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Accession no.

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